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Title:
Order from Chaos

Cosmology and Political Thought in Seventeenth-Century England

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A dissertation submitted to the University of Bristol in accordance with the requirements for award of the degree of MPhil in the Faculty of Arts, June 2020.

Word Count: 22,010

Abstract

This thesis situates the political thought of Thomas Hobbes, particularly *Leviathan* of 1651, in the wider context of changing ideas about the cosmos. In so doing, it investigates an overlooked concept of plurality of worlds and its effect on the world view in seventeenth-century England. In the late sixteenth and seventeenth centuries, human consciousness confronted a transition in the traditional relationship between nature, humans and society. However, insufficient attention has been paid to the motivating scientific forces behind English political thought over this period, especially to the concept of "plurality of worlds" which has been neglected at the expense of Copernican heliocentrism. The old system of order no longer functioned adequately due to a breakdown in traditional cosmological ideas, which meant disorder and a consequent search for alternatives. On the one hand, scientific developments of the period, such as the invention of the telescope, proved new hypothetical ideas of an infinite universe with a plurality of worlds. On the other hand, the developing ideas of "self" emerged as a conscious force, which referred to a consequent search for temporal secular salvation (the sovereign state). This development of self-consciousness can be traced in English political thought during this period. This paper does not discuss the entirety of the scientific revolution or of Thomas Hobbes, which have been sufficiently examined, but focuses specifically on the relationship between "plurality of worlds" and his political thought. This thesis will show that existing contemporary British intellectual history overlooks cosmological narratives through exploring the intersection between science, philosophy and politics in the early modern period. It therefore adds to a growing literature which introduces cosmology as a different perspective to understanding British sovereignty.

Acknowledgements

Firstly, I would like to thank my main supervisor Professor Ronald Hutton for all the support and guidance he has given me throughout my studies, which means huge to me. I also owe thanks to Dr John Reeks for his advice and help. Thanks to my two examiners: Dr Kenneth Austin and Dr Signy Gutnick Allen. Their suggestions have inspired me a lot. I would like to thank all the people who cared and encouraged me a lot, especially for my friends Tabitha Stanmore, Edward Rendall and Can Wang. Finally, I cannot tell how much I am grateful for my parents' love and support.

Author’s declaration

I declare that the work in this dissertation was carried out in accordance with the requirements of the University's Regulations and Code of Practice for Research Degree Programmes and that it has not been submitted for any other academic award. Except where indicated by specific reference in the text, the work is the candidate's own work. Work done in collaboration with, or with the assistance of, others, is indicated as such. Any views expressed in the dissertation are those of the author.

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Chapter One: Introduction

Edmund Spencer published his *Faerie Queene* in 1590 presenting an early modern depiction of the universe that "What if within the Moones fayre shining spheare/ What if in euery other starre vnseene/ Of other worldes he happily should heare."[1] In this poem, Spencer imagined that both Moon and other stars may have their own worlds and thus may contain intelligent life. Furthermore, as Spenser speculated that each star may be a world, he intimated that a plurality of worlds could refer to an infinite universe.[2]

Spenser probably provided one of the earliest references in English literature to other possible worlds beyond earth.[3] This work suggested that the English intellectual was beginning to look to a wider universe, whereas previously it was were presented as the ancient cosmology which denied the possibility of a plurality of worlds. It was worth noting that this work was almost 20 years before the concept of "other worlds" was finally supported by Galileo's telescopic observations (1609).

Thus, this narrative of progression signalled a shift of cosmological thought instigated by the assimilation of Nicolaus Copernicus's revolution into British society. It brings us to a not yet fully addressed question: how and why the seventeen-century English intellectuals respond to this new challenge, namely a plurality of worlds of an infinite universe?

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[1] See the proem of Book II, 3.4-8, in *The Faerie Qveene*, ed. A. C. Hamilton (London: Longman, 2001)

[2] Steven J. Dick, *Plurality of Worlds: The Origins of the Extraterrestrial Life Debate from Democritus to Kant* (Cambridge: Cambridge University Press, 1982), p.2.

[3] Paul H. Kocher, *Science and Religion in Elizabethan England* (San Marino: Huntington Library, 1953), p.86.

To understand how the concept of "plurality of worlds" was received in England, and the importance of these cosmological changes, the relationship between these new knowledge and political thought need to be addressed. This dissertation seeks to examine the intersection between new cosmic knowledge and humans' place within it, especially the changing perception of the notion of a "plurality of worlds", and how it affects political ideas about order, nature, and state in the seventeenth-century England. Each chapter of this thesis will investigate one of these themes and how it contributed to the formation of political thought in early modern England.

The first Chapter includes two sections, historiography and methodology. Together they provide a foundation for this thesis. Historians of science have often discussed how the Copernican revolution transformed Western thought, especially in astronomy, mathematics, and religion; this part argues that they have misunderstood the nature of the cosmological challenge to anthropocentrism. Instead, this part will argue that it is the possibility of a plurality of worlds and the idea of the infinite universe threatened the old stable universal order. The new Copernican knowledge challenged both traditional ideology and conventional thought; it was a philosophical, intellectual and theological challenge.

When the old system of order no longer functioned adequately due to a breakdown in traditional cosmological ideas, what political theory became implausible or inappropriate? The heightened awareness of chaos that led to a renewed emphasis on order and control can be traced in English intellectual history during this period.

Following Chapter one, Chapter two will develop arguments about the nature and

significance of the cosmological shift to seventeenth-century thought. In other words, this chapter will seek to illustrate what political theory looked like in a post-Copernican Revolution context. It will examine the state of cosmography and how continental ideas regarding the shape of the cosmos were received in England in the seventeenth century. Although the new astronomy did not produce a straightforward or definitive transformation of political thought in general, in at least a handful of texts the expanded universe enabled an alternative unearthly perspective.

To explain this point, one of the period's systematic and scientifically-minded thinkers, Thomas Hobbes, is probably a good place to look for such implications. Therefore, it will use Thomas Hobbes as a case study to show how to establish the representative secular sovereign state as unrelated to the divine cosmos.

This chapter will suggest that it is possible to trace the shift from the traditional order to the Hobbesian by analysing the structural modifications in cosmic vision. It will firstly introduce some key concepts like a mechanic instead of organic conception of the universe and self-consciousness. To illustrate how these ideas were expressed, it draws on some primary sources, such as Giordano Bruno, Galileo Galilei, Rene Descartes as well as Thomas Hobbes. It also will examine how Hobbes received and digested the scientific theory regarding the change of cosmos.

Based on Chapter two, Chapter three moves to Hobbes's *Leviathan,* examines how Hobbes's use of ideas like fragility, nature and organism and tracks or changes how these were used in a pre-Copernican model. It will discuss how the shift away from a divine cosmos to an infinite universe further complicated the way in which humans

confronted chaos and fear. Then it will examine how human consciousness confronted a transition in the traditional relationship between nature, humans, and society. In order to find a necessary solution, it was inevitable to create a new political theory. This part will mainly examine how Thomas Hobbes illustrated the new possibilities of a new way to think about political theory in this background.

Finally, this part will argue that Hobbes was aware of the philosophical problems raised by new natural science, and he was concerned with political theories and basic concepts of the sovereign state. Conceptions of nature, of the self, of the larger cosmos, and of the relationships among them paved a way for Hobbes to describe the secular sovereign state. However, the narrative was not that straight forward. This part will discuss the extent to which mechanistic vision of the universe is a condition for Hobbes's theory.

Ultimately, this thesis does not discuss the entirety of the scientific revolution or of Thomas Hobbes, which have been sufficiently examined, but focuses specifically on the relationship between "plurality of worlds" and how English thought searched for coherence and certainty in the seventeenth century. This paper will show that existing contemporary British intellectual history overlooks cosmological narratives when exploring the intersection between science, philosophy, and politics in the early modern period. It therefore adds to a growing literature that introduces cosmology as a different perspective for understanding British political thought.

Historiography

Britain underwent significant changes in almost every aspect during the fifteenth to the seventeenth century, which has produced a vast and diverse historiography around early modern England. Despite a broad spectrum of subjects being addressed by academics, the changes to the understanding of the cosmos and political thought within the historiographies are often missing. Therefore, the direction of influences is not always clearly stated. Through exploring related modern scholarship in a vast library of books and articles in science, politics and literature, this research will add nuance to the understanding of how the impact of changing cosmological beliefs on the thought of political theory over this periods, as well examine the thought of Thomas Hobbes into a wider historical narrative.

Some historians have addressed the traditional cosmological thought before the Copernican Revolution in England. Paul Kocher in *Science and Religion in Elizabethan England* explained that the orthodox view held by many Elizabethan cosmologists was of Platonic-Pythagorean concepts of a harmonious and interdependent universe.[4] Edward Grant, in *The Foundations of Modern Science in the Middle Ages* suggested that the combination of Aristotelian natural philosophy with Christian theology during the late Middle Ages provided a foundation for scientific knowledge.[5] Both of their works shows that the concept of a "cosmos" in the period normally means a universe

[4] Kocher, *Science and Religion in Elizabethan England*, p.323.

[5] Edward Grant, *The Foundations of Modern Science in The Middle Ages: Their religions. Institutional and Intellectual Contexts (*Cambridge: Cambridge University Press,1997), p.136.

composed of one central Earth, Moon, Sun, the other five planets, and the fixed stars. It was an entire geocentric universe.

Though a vast number of books and articles on the history of science have been composed over the last century, the impact of "plurality of worlds" has been largely overlooked. The debate over "plurality of worlds" became heated again in the late sixteenth and early seventeenth centuries when the new Copernican heliocentric system made Earth like any other planet and no longer the centre of the universe.[6]

During the early modern period the understanding of Copernican theory underwent significant change. John L. Russell in *The Copernican System in Great Britain* suggested that John Dee, who was Queen Elizabeth's astrologer, "though respectful", "was apparently unconvinced of Copernicus's theories."[7] He declared that the general acceptance of Copernicus's theory in England was "effectively won by 1650."[8] He thought that for much of this period, England was isolated from the continent in scientific aspects.[9] Russell believed that "The first English writer to refer to the Copernican theory was Robert Recorde (c.1510-1558) in his book *The Castle of Knowledge* (1556)….He was at least sympathetic to the full Copernican system but his description on it was very incomplete."[10] This study on the background of early modern English science obviously serves a valuable purpose for mine.

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[6] *Cosmology: historical, literary, philosophical, religious, and scientific perspectives*, ed. by Norriss S. Hetherington (New York: Routledge, 1993), Introduction, p.518.

[7] Thomas Digges, *A Prognostication Everlasting*.1576. John L. Russell. *The Reception of Copernicus' Heliocentric Theory*. Ed. Jerzy Dobrzycki (Dordrecht: D. Reidel Pub. Co., 1972), p.202.

[8] John L. Russell, *The Reception of Copernicus' Heliocentric Theory*, ed. by Jerzy Dobrzycki. (Dordrecht: D. Reidel Pub. Co., 1972), p.223.

[9] Russell, *The Reception of Copernicus' Heliocentric Theory*, p.189.

[10] Robert Recorde, *The Castle of Knowledge* (London: ReginaldeWolfe, 1556); Russell. *The Reception of Copernicus' Heliocentric Theory*, p.190.

Other historians like Frances Yates have emphasised the importance of Giordano Bruno's visit to England. She has given a more specific description of Bruno's connection with Hermetic tradition. Bruno is usually treated as a believer in astrology, magic and a scientific philosopher. He was an advocate of the infinite universe and influenced many fields of contemporary culture, especially in the newly developing field of natural philosophy.[11]Yates has successfully established the cultural atmosphere of the sixteenth century when the religious debates and the rise of modern nations intertwined. Intellectuals of that time had to consider the possibility that the Church and the old political order could collapse.[12] This suggested the importance of the recovery of classical texts, during the period from the fifteenth to the seventeenth centuries, for an understanding of the religious and scientific developments taking place at the same time.

Among followers of Copernicus, Galileo continued to prove Copernicus's theories and when he looked through his telescope, the whole universe changed.[13] His invention of the telescope could be used to validate that a plurality of worlds was possible, and theologians explained this discovery as an evidence of God's creative omnipotence.[14] Johannes Kepler, who was an astronomer, admitted the possibility of pluralism as well.[15] Together they formed a possibility of other worlds of an infinite universe.

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[11] Frances A. Yates, *Giordano Bruno and the Hermetic Tradition* (Chicago: University of Chicago Press; Toronto: London: Routledge and Kegan Paul, 1964), p.102.

[12] Yates, *Giordano Bruno and the Hermetic Tradition*, p.102.

[13] Perhaps the definitive treatment of the differences between the old and new orders is Galileo's own *Dialogue Concerning the Two Chief World Systems*, trans. Stillman Drake, 2nd. (Berkeley and Los Angeles: University of California Press, 1967)

[14] Dick, *Plurality of World*, p.85.

[15] Johannes Kepler, *Mysterium Cosmographicum* (*The Sacred Mystery of the Cosmos*),1596.

In 1982, Steven J. Dick in his work *Plurality of Worlds* examined different propositions of other worlds from Democritus to Newton, giving a whole picture of the plurality debate from ancient Greece to the eighteenth century.[16] According to Dick, the concept of other worlds was summarized by the English clergyman Robert Burton in *Anatomy of Melancholy* published in 1621.[17] Thomas Digges was considered as "the earliest Copernican in England and Digges expanded the closed cosmos to an infinite universe."[18]

The book therefore offers some very useful insights and provides a comprehensive look at the history of the concept. However, Dick left much still to be explored: for example, how cosmic pluralism was perceived more widely, what was the status of humans and Christianity, and how to deal with the unique position of the human being. Though a fascinating resource, this book alone cannot provide a complete picture.

Understanding the concept and meaning of "plurality of worlds" through different aspects of scholars' works is useful because the current narratives of cosmology studies are largely pure scientific angles. *The Great Chain of Being: A Study of the History of an Idea*, by Arthur O. Lovejoy is invaluable for helping us to understand this concept and to explain the contradiction between the metaphysical principle of plenitude and the plurality of worlds concept.[19] Ralph V. Chamberlin gave a detailed discussion of inhabited worlds from a scientific perspective.[20] *The Extraterrestrial Life Debate*

[16] Dick, *Plurality of Worlds*, p.1.
[17] Dick, *Plurality of Worlds*, p.202.
[18] Dick. *Plurality of World*, p.86.
[19] Arthur O. Lovejoy, *The Great Chain of Being: A Study in the History of an Idea* (New York: Harper Torchbooks, 1960), pp.156-158.
[20] Ralph V. Chamberlin, "Life in Other Worlds: A Study in the History of Opinion," *Bulletin of the University of Utah*, 22, no.3,1932, pp.3-52.

written by Michal J. Crowe examined the scientific and philosophical influence of the plurality of worlds debate.[21] Stanley J. Jaki in *Planets and Planetarians* discussed this debate comprehensively.[22] David K. Lewis examined the concept of "worlds" in *On the Plurality of Worlds*.[23] All of these valuable works paved the way for further research into the plurality of worlds in early modern England.

Besides Giordano Bruno, the position of René Descartes (1596-1650) in the planet debate has been suggested earlier. Descartes's discussion of the plurality of worlds seems to open a door for later scholars to follow. In fact, Lovejoy, Dick and Brake agreed that the Cartesian system of the world was "the most important pluralist cosmology of the seventeenth century."[24] Descartes interpreted infinity and plenitude as a metaphysical issue to show humans' insignificance in the universe.[25] However, "reason" was compensation this.[26] In England, one of Descartes' followers, Henry More (1614-87) in the poem *Democritus Platonissans, or, An Essay upon the infinity of worlds out of Platonick Principles* showed his paradoxical position in the other worlds debate. Michael J. Crowe suggested that in 1642, More in *Psychothasia Platonica* rejected the idea of an infinity of worlds, whereas More endorsed it in his 1646 work.[27]

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[21] Michel J. Crowe, *The Extraterrestrial Life Debate, 1750-1900: The Idea of a Plurality of Worlds from Kant to Lowell* (New York: Cambridge University Press, 1986), p.1.

[22] Stanley J. Jaki, P*lanets and Planetarians: A History of Theories of the Origin of Planetary Systems* (New York: John Wiley,1977), p.1.

[23] David K. Lewis, *On the Plurality of Worlds* (Oxford: Blackwell,1986), p.1.

[24] Mark Brake, *Alien Life Imagined*: *Communicating the Science and Culture of Astrobiology* (Cambridge: Cambridge University Press, 2013), p.116; Lovejoy, *The Great Chain of Being*, pp.123-125; Dick, *Plurality of Worlds*, p.117.

[25] Dick, *Plurality of Worlds*, p.107.

[26] Dick, *Plurality of Worlds*, pp.123-125.

[27] Crowe, *The Extraterrestrial Life Debate, 1750-1900*, p.66.

The possibility of a plurality of worlds brought a prominent concern which was how to deal with the supposedly unique relationship between humans, nature and God, especially human dignity. This acknowledged that there was no model to replace the old Aristotelian-Ptolemaic system which accorded with Christianity.

One of the classics concerning Renaissance philosophical thought is Ernst Cassirer's *The Individual and the Cosmos in Renaissance Philosophy.*[28] Within the book, he showed how the new universal life leads to the demand for a new cosmos of thought with human self-consciousness.[29] This has opened a gateway for historians to explore the cosmological ideas within human self-consciousness. Cassirer believed in the relationship between man's ego and the universe as "the enclosing and the enclosed."[30] Thus, the cosmos and the ego reacted mutually. It is an interesting topic that has been overlooked for several years.

As for this point, Norbert Elias in *Involvement and Detachment* described the picture provided by Copernicus and its influence on humans' reflections of themselves and their position in the universe.[31] The idea of possible worlds led to philosophers and political theorists starting to consider humans as independent and fragile creatures.[32] Thus, the development of self-consciousness and reason rose together. This

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[28] Ernst Cassirer, *The Individual and the Cosmos in Renaissance Philosophy*. trans. Maria Domandi. (Philadelphia: University of Pennsylvania Press,1963), p.1.

[29] Cassirer, *The Individual and the Cosmos in Renaissance Philosophy*, p.89.

[30] Cassirer, *The Individual and the Cosmos in Renaissance Philosophy*, p.190.

[31] Norbert Elias, *Involvement and Detachment* (Oxford: Basil Blackwell,1987), pp.68-9.

[32] Eric Voegelin used this point to interpret Thomas Hobbes's *Leviathan*. Eric Voegelin, *History of Political Ideas, Vol. 7: The New Order and Last Orientation*, in *The Collected Works of Eric Voegelin*, vol. 25, (Columbia: University of Missouri Press,2002), p.71. Also see Leo Strauss, *The Political Philosophy of Hobbes* (Oxford: Oxford University Press,1936), p.90.

transformation caused by a new cosmological perspective seems to have been neglected in intellectual history.

A significant cause for the shifting cosmology was the crisis of self-consciousness that arose with the cosmic expansion. By disrupting one's relationship to the other, to the natural world and perhaps even more significantly, one's relationship to God, the medieval political order started to change. Perhaps by accepting alien others as equal, people could find comfort in sharing such a vast space.

Although the implicit relationship between the cosmological change and political thought has not been addressed in some histories, Francis R. Johnson in his *Astronomical Thought in Renaissance England* realized it was worthwhile to explore scientific development in the reign of Elizabeth I, and its connections with the Civil Wars of the next century.[33] Based on Johnson's work describing the scientific development in late sixteenth- and early seventeenth-century England, the historian Christopher Hill made his excellent contribution in response to these questions. Hill noticed that there was a connection between "the new astronomy" and the concept of a plurality of worlds in Bacon's thought, but did not clearly explain the suggested link.[34] Hill's study is an enlightening source both for scientific literature and for political thought. It also helps historians further to contextualise the early modern English social condition.

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[33] Francis Johnson, *Astronomical Thought in Renaissance England: A Study of the English Scientific Writings from 1500 to 1645* (Baltimore: The John Hopkins Press,1937), p.1.

[34] Christopher Hill, *Intellectual Origins of The English Revolutio*n (London: Oxford University Press,1965), p.68.

In 1967, Hugh Trevor-Roper published an essay entitled *Religious Origins of the Enlightenment*, expressing his criticism of Hill's book.[35] Trevor-Roper believed that his abuse and misrepresentation of source material showed that Hill's answer was problematic. John Robertson also wrote an essay about the Hill/Trevor-Roper debate.[36] However, some questions Hill raised were interesting. While Hill emphasised the influence of technological innovations on economical and practical dimensions; little attention was paid to "pure" science, especially the driving force behind it. But it is difficult to discern how much these factors influenced most intellectual groups of people in England, along with a systematic understanding of some changes in the cosmological assumptions of natural philosophy.

A historian of political thought, J. G. A. Pocock, noticed in his book *The Ancient Constitution and the Feudal Law: a study of English Historical Thought in the Seventeenth Century* that historians of the seventeenth century sometimes spoke of the death of nature, which reflected the mechanization of the natural world.[37] Moreover, new questions arose in terms of the relationship between God, humans and nature. This change brought a corresponding change in political thought.[38]

Agreeing with Pocock, Hans Blumenberg assumed that when the earth became just one possible world among other worlds, nature lost its power to command imitation

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[35] H.R. Trevor-Roper, *Religion, the Reformation and Social Change, and Other Essays* (London, 1967).

[36] John Robertson, "Hugh Trevor-Roper, Intellectual History and 'The Religious Origins of the Enlightenment'." *The English Historical Review* (vol. 124, no. 511, 2009), pp.1389–1421.

[37] J. G. A. Pocock, *The Ancient Constitution and the Feudal Law: a study of English Historical Thought in the Seventeenth Century* (Cambridge: Cambridge University Press,1957), p.109.

[38] Dmitri Levitin. "From Sacred History to the History of Religion: Paganism, Judaism, and Christianity in European Historiography from Reformation to 'Enlightenment'." *The Historical Journal*, vol. 55, no. 4, 2012, pp.1117–1160.

for humans. The result was that the natural world was revealed as mechanical and indifferent.[39] Thomas Hobbes lived with this background, and thus he needed to build a new model to ensure salvation from the temporal world and make sense of humans' unique place in the universe.

The British historian of astrology and cultural astronomy, Nicholas Campion, explained in the paper *Astronomy and political theory* that astronomical models could and did influence political theory.[40] He regarded Hobbes's thought as "*Political Galileanism*" because Hobbes made the state as mechanical as the universe.[41] Frithiof Brandt in his book *Thomas Hobbes' Mechanical Conception of Nature,* also provided a careful and detailed literature of Hobbes's mathematic-mechanical view of nature.[42] There are questions still in need of explanation. What did Hobbes actually mean when he treated everything mechanically? Why did he think so? And what is the relationship between this view and his political thought?

Another intellectual historian, Quentin Skinner, paid more interest to the specific thought of individuals. In searching for the origins of the concept of the modern state, Skinner traced the formation of "reason of state" and the emergence of a theory of self-preservation respectively. This paper assumes the latter referred to the rational, isolated individual in a hostile world seeking for security, which was most accomplished in Thomas Hobbes's theory. Indeed, Skinner's two theories shared a common background

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[39] Hans Blumenberg. "To Bring Myth to an End." *New German Critique*, no. 32, 1984, pp.109–140.

[40] Nicholas Campion. "Astronomy and Political Theory" *Proceedings of the International Astronomical Union* 5. S260,2009, pp.595-602.

[41] Campion, "Astronomy and Political Theory", p.598.

[42] Brandt Frithiof. *Thomas Hobbes' Mechanical Conception of Nature* (Copenhagen: Levin & Munksgaard, 1928), pp.86-166.

in the seventeenth century when Europe was in intense conflict between Catholics and Protestants. Furthermore, there was a transformation occurring in the theory of natural philosophy because of the possibilities of other worlds. A new way with regard to relationships between political, religious and moral issues emerged in mid-seventeenth century England.

Based on Skinner's work, Richard Tuck dealt with the opposition between the republicanism and mixed monarchicalism of this period. Tuck revealed the progressive transformation in the theory of natural rights illustrated by Hugo Grotius, John Selden, and Hobbes.[43] Their theories laid a foundation of enlightened science and enlightened politics for the next century. This was a valuable insight and Tuck located Hobbes's theory in the context of scepticism.[44] But he seems to omit another attractive interpretation: that maybe Hobbes's political concern was not the foundation of states or the state of nature. Rather, it was how to settle disagreements in judgment to make sure of individuals' security and guard against disorder in a hostile and temporal world. Each of these books has laid the foundations for later historians' research, and they will undoubtedly be invaluable for this thesis.

The corpus of literature on the history of science and intellectual history is vast so that what was discussed here can only represent a small fraction of the material. There is still much to discover in this broad and fascinating field. Although there is much written about the history of early modern England, there is as yet no study which tracks

[43] Richard Tuck. *Philosophy and Government 1572-1651* (Cambridge: Cambridge University Press, 1993), pp.154-279.
[44] Tuck, *Philosophy and Government*, pp. xii-xvii.

the concept of "plurality of worlds" and its influence on early modern political thought. This is crucial: knowing more about the evolution of the scientific revolution will tell us much about how to understand the birth of the modern world. There is a misleading understanding of the link between the Copernican heliocentrism and anthropocentrism. "Plurality of worlds" has not received enough attention, having only gained a targeted study of their own in the last few years.

Generally speaking, it is an impossible task to describe all the intellectual forces at play in early modern England. Indeed, the early modern era was a composite of a number of traditions and to isolate any single element would be an unhelpful simplification. While there are many persuasive studies which have been made of the Medieval and early modern origins of the modern world, based on many scholars' brilliant works which have been discussed above, this thesis will begin to address the current lack of acknowledgement around the histories of "plurality of worlds". It will demonstrate the changes in cosmological thinking and how the intellectuals respond to the new knowledge in the late-sixteenth and the seventeenth-century, helping us to supplement a broader narrative of early modern England history.

Methodology

Professor John Robertson defined intellectual history as "the efforts of humans to make sense of their world, to conceptualise its features and to argue coherently about them, and to persuade others of the plausibility of their arguments."[45] J.G.A. Pocock and

[45] John Robertson pointed this out in a speech in Fudan University in China on May, 2017. Full Chinese version published in *Zhejiang Academic Journal*,20181,2018, pp.148-155.

Quentin Skinner led an intellectual history tradition by criticizing the old one which took the history of ideas as a set of timeless and universal ideas.[46] The leading historian of the history of ideas was Arthur Lovejoy, who defined the discipline as exploring one major idea in different contexts and times. As Lovejoy had argued in 1960 in his book, "unit ideas" showed an internal coherence in history, and thus the task of historians was to demonstrate these thoughts from the historical narrative with their internal logic.[47] The drawback of this older method was that it tended to encourage belief in a pre-existing "eternal" thought in various contexts.

In 1969, Skinner proposed an alternative method based upon analysing an idea "specific to its own situation in a way that it can only be naive to try to transcend."[48] He urged a new method based on wider sources instead of classic texts and paying attention to the importance of rhetoric. To understand the incoherence in classic texts or ideas of individuals, Skinner intended to examine the precise circumstances which led men to select and use specific arguments at particular times. To understand the change of ideas, it is necessary to examine both the political and scientific history of the period and the arguments within it.

The links between the arguments and specific circumstances need to be explored as the former were not merely a reflection of the latter. Instead, traditional ideas and ways of thinking usually interacted with specific events and social changes to produce

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[46] Quentin Skinner, "Meaning and Understanding in the History of Ideas", *History and Theory*, 8 ,1969, pp.3-53; "Motives, Intentions and the Interpretation of Texts", *New Literary History*,3,1972, pp.393-408. J. G. A. Pocock, *Politics, Language and Time: Essays in Political Thought and History* (New York, 1971)

[47] Lovejoy, *The Great Chain of Being: A Study in the History of an Idea*, pp.67-99.

[48] Skinner, "Meaning and Understanding in the History of Ideas", p.50.

new arguments and new values. As has been addressed already, this thesis will follow this method and focuses on early modern thinkers and the context in which they lived, namely who are they, how they argue their opinions, and why they chose these opinions rather than others. In order to understand these changes in the seventeenth century, especially in Hobbes' thought, it is necessary to try to rebuild the context in which he lived. Then it is possible to explore which specific arguments he selected to respond to political debate in the period, and why.

To achieve this goal, the thesis has adopted "an approach which is both textual and contextual."[49] It chooses Thomas Hobbes's writings as primary resources including *The Elements of Law* (1640), *De Cive* (1642), *Leviathan* (1651), *On subjects* (1655). Besides these works, there is Bacon, Descartes, Galileo and other early modern thinkers' primary materials. Signy Gutnick Allen claims that her interpretive approach is to "explain developments in Hobbes's thought primarily by reference to other elements of his theory."[50] Following this principle, this thesis examines the relationship between Hobbes's scientific views of the universe, namely motion theory and the origin of sovereign rights.

This thesis also follows what Signy states that "where contradictions have arisen within individual texts, I have opted for the interpretation which best preserves the coherence of the theory as a whole, rather than one which requires that Hobbes was entirely consistent in his use of language."[51] This point is useful when trying to link

[49] Signy Gutnick Allen, *Thomas Hobbes's Theory of Crime and Punishment* (Unpublished doctoral dissertation, Queen Mary University of London, 2016), p.12.
[50] Signy, *Thomas Hobbes's Theory of Crime and Punishment*, p.13.
[51] Signy, *Thomas Hobbes's Theory of Crime and Punishment*, p.14.

Hobbes's scientific insights with his political thought. In addition to analysing Hobbes's view, this thesis aims to examine the change of cosmological and political thought in early modern England. In providing a discussion of early modern political theory after the Copernican Revolution, this thesis therefore illustrates the political salience of the cosmological shifts.

Chapter Two: New Perspectives

The Definition of "Cosmology"

When attempting to explore a historical set of ideas or beliefs related to "cosmology", the meaning of the term has to be considered according to the specific historical context. The core question arouses: why would shifts in cosmological ideas implicate other categories of thought, especially political thought. Therefore, it is crucial to first establish what is meant by "cosmos".

The philosopher Milton K. Munitz offered some insights in his work *Cosmic Understanding* published in 1986. Munitz argued cosmology had a philosophical meaning for humans and described it as containing three levels of meaning. The first was "a purely intellectual craving and sense of wonder pushing humans to explore the universe."[52] The second was psychological security: that "humans need to situate their life in the universe."[53] This meant that humans assign themselves a position within the cosmos to gain psychological satisfaction and security and thus establish a purposeful system for humanity and society. Finally, there was a desire to understand the universe metaphysically, to establish "the fundamental levels, kinds, categories, types, degrees, or modes of that which exists or has being."[54] The above definitions by Munitz emphasised humans' desire and intention in a psychological and philosophical worldview, both of which undoubtedly feature heavily in a conceptual system, but were flexible enough to apply to multiple historical periods and contexts.

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[52] M. Munitz, *Cosmic Understanding* (Princeton: Princeton University Press, 1986), pp. 4-6.
[53] Munitz, *Cosmic Understanding*, pp. 4-6.
[54] Munitz, *Cosmic Understanding*, pp. 4-6.

Nevertheless, this is not to say a society always possesses a single and coherent cosmology. Rather, different answers to Munitz's three levels led to intellectual and social controversy rooted in different cosmological assumptions. A French historian of philosophy, Rémi Brague, developed Munitz's argument in the work *The Wisdom of the World* in 2004. Brague traced the deep connection between the universe and humanity through the views of ancient Greece, Christianity, and Judaism. He presented an argument that cosmology was primarily a discourse between Man and world and therefore contained ontological and anthropological order.[55] Finally, Brague described cosmology as signifying that "mankind's place in the universe involved philosophical, political and religious themes: the significance and value of human life, the laws of nature, a divine cosmic designer and the secular order for the human being."[56] This was a sensible conclusion which contributes to a general understanding of cosmos which can be used in Western thought. It is problematic, however, as a category of historical analysis, because the definition is too broad to discuss the particular context of cosmology in seventeenth-century England.

Ultimately, cosmology is a mixture of all of these definitions in varying and changeable ways. Both of these scholars argued that the concept of cosmology was bound up with human emotional attachment, which may help to explain why the possibility of cosmological pluralism took a long time to be generally accepted. Based on their works, I define cosmology as a mixed conceptual system designed by human

[55] Rémi Brague, *The Wisdom of the World: The Human Experience of the Universe in Western Thought* (Chicago: University of Chicago Press, 2004), pp.1-5.
[56] Brague, *The Wisdom of the World*, pp.6-10.

beings to achieve particular interconnected and integrated relationships with the natural world. Though cosmology has often involved relationships with the supernatural, and divine, world as well.

The Old Cosmological Order

Different epochs of European thought considered the universe, the nature, and man in various ways. In Middle Ages, the concept of "plurality of worlds" was influenced by ancient cosmology. The natural world was guided by the divine cosmos and chaos was prevented. Aristotle rejected a multiplicity of worlds as he concluded in *On the Heavens* that there is "neither place nor void nor time beyond the heaven."[57] The superlunary sphere was by the Aristotelian definition without change and all else in the cosmos was unchanging and balanced.[58] The earth's central position in the cosmos remains motionless, at least metaphorically still, because change in this context constituted corruption and disharmony.[59]

In the twelfth century, the Latin translations of Aristotle's works were introduced to Europe.[60] His medieval followers Albertus Magnus and Thomas Aquinas synthesized Aristotelianism with Christian theology, which further reinforced the opposition to plural worlds. As Steven J. Dick notes, a plurality of worlds had "grave implications" for Church doctrines, including "Redemption, Incarnation, and the implied one-to-one

[57] Edward Grant, *Planets, Stars, and Orbs: The Medieval Cosmos, 1200-1687* (Cambridge: Cambridge University Press, 1994), p.150-151.
[58] Marjorie Hope Nicolson, *The Breaking of the Circle: Studies in the Effect of the "New Science" on Seventeenth-century Poetry* (New York: Columbia University Press, 1962) p.29.
[59] Dick, *Plurality of Worlds*, p.60.
[60] Grant, *Planets, Stars, and Orbs*, p.19.

relationship between man and his Creator."[61] Christians blended Greek cosmology with providentialism, which means God worked through second forces to influence all creations.[62] The closed, ordered and hierarchical cosmos connected with a stable framework and meaning guided by God. God created everything in the universe, including nature and humans. It was believed that there was a correspondence between humans and the universe.[63] The superlunary sphere where God and angles live was constant, invariant, beautiful and good. On the contrary, the earth where human beings live was seen as a region featured by diversity and change, birth and death, generation and extinction. This model laid the foundation for early modem cosmology.

To understand the relationship between the cosmos and man thoroughly, it is necessary to review the wider context of sixteenth-century and early seventeenth century thought. In the sixteenth and early seventeenth century, English writers lived in a world which was described as a combination of Greek cosmology and the Christian version. Popular belief held that the divine cosmos represented perfection, order and purpose. The system of celestial planets inspired human beings and thus they imitated the natural laws in society.[64]

Besides, it produced and controlled the diversity and changes on earth. The fortunes of the human world could be predicted by divining the celestial sphere, which meant moral practice must take the regularity of the world as its role model. God

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[61] Dick, *Plurality of Worlds*, p.89.

[62] E. M. W Tillyard, *The Elizabethan World Picture: A Study of the Idea of Order in the Age of Shakespeare. Donne and Milton* (New York: Pelican Books, 1972), p.45.

[63] R. G. Collingwood, *The Idea of Nature* (New York: Oxford University Press, 1972), p.9.

[64] Alexandre Koyre´, *From the Closed World to the Infinite Universe* (Baltimore: The John Hopkins University Press, 1957). p.29.

determined the content of laws of nature and nature had ethical significance for humans.[65] Before the Copernican revolution, the old hierarchical cosmological order contained distinct classes relating to each other.

Corresponding to the patterns of the cosmos in which all matters were ordered hierarchically, James Daly adopted Lovejoy's explanation of the notion of the Great Chain of Being, which was "an interlocking and interdependent scheme of created things existing in a natural hierarchy."[66] One of the most typical examples was Jean Bodin who connected his political system with the cosmological hierarchal system. Bodin applied cosmic order to civilian order as he believed the former is superior to the empirical political order.[67]

Bodin wrote that "I have, however, a firm conviction that [astronomical] regions and celestial bodies do not have the power to exercise ultimate control (a belief wrong even to entertain), yet men are so much influenced by them that they cannot overcome the law of nature except through divine or their own continued self-discipline."[68] In Bodin's view, he admitted the influence of law of nature from the divine cosmos while he left room for humans' self-consciousness. This particular arrangement implied an internal hierarchy system which reflected the principles of the traditional cosmological order.[69]

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65 Tillyard, *The Elizabethan World Picture*, p.54.

66 James, Daly, "Cosmic Harmony and Political Thinking in Early Stuart England", *Transactions of the American Philosophical Society*, vol. 69, no. 7, 1979, p.3.

67 Nicholas Campion, "Political Cosmology in the Renaissance", Paper delivered to the Inspiration of Astronomical Phenomena (INSAP II) conference, Malta, 1999.

68 Jean Bodin, *Republic*, Book 4, Chapter 2.

69 Daly, "Cosmic Harmony and Political Thinking in Early Stuart England", p.5.

Moreover, the whole universe was understood as animated by laws which were necessary for the entire system. Theorists and politicians believed that there was a fundamental law and human was subject to it. As Richard Hooker said, "Of Law there can be no less acknowledged than that her seat is the bosom of God, her voice the harmony of the world: all things in heaven and earth do her homage, the very least in feeling her care and the greatest not exempted from her power."[70] In this system, human beings took a significant part in imitating laws from the superlunary region. Since everything was related, all were alike to be changed if the cosmic order collapsed. Humans had the key position in the chain of being, which provided possibilities for self-awareness once the ordered universe was replaced by an infinite and decentred one.

Besides macrocosm, the "little world" of man which Nicolson mentioned as microcosm cannot be ignored. "Back of all these—elements, planets, humors—lay one central conception: belief in the interrelationship of the little world of man and the great world of the universe."[71] Aristotelian cosmology taught, and most Elizabethans believed, that the sublunar sphere alone was mutable due to the imbalanced intermixing of elements. There existed four elements with corresponding qualities exclusive to each: earth, water, air, and fire. The fifth element only existed in the celestial realm, giving substance to heavenly bodies and to the angels who moved them about the universe.[72]

The elements did not exist in pure form. On the contrary, stars, planets, and the moon influenced elements within the sublunary sphere. The elements moved, mixed,

[70] Richard Hooker, *Of The Laws of Ecclesiastical Polity* (London: Everyman's Library, 1963), I. xvi, p.8.
[71] Nicolson, *The Breaking of the Circle*, p.16.
[72] Koyre´, *From the Closed World to the Infinite Universe*, p.25.

to form the compounded stuff of nature. All change and variety were caused and maintained as celestial influenced the earth. Without this influence, all matter exists in a state of chaos. As John Milton wrote,

"And chaos, ancestors of Nature, hold Eternal anarchy, amidst the noise Of endless wars, and by confusion stand. For Hot, Cold, Moist, and Dry, four champions fierce, Strive here for mastery, and to battle bring, Their embryon atoms."[73]

Chaos must be prevented because the divine cosmos maintained a constancy of order. The best state was motionless and stillness was superior to movement. However, everything on earth, including human beings, was "restless." The Aristotelian explained that there was a "self-moved" soul striving internally. Living under the protection of the finite and closed cosmos, intellectuals used to consider internal rather than external forces in the search for motivations. Political thinkers used this metaphor to describe the proper ordering of society. "Whereupon as it would be a thing monstrous and incommodious to see a human body wholly compounded of heads arms legs or of other members uniform in themselves, so would it be altogether as disproportionate and a thing of itself insufficient if all men in a city were artificers husbandmen soldiers judges or of one self-condition and quality."[74] Society was constituted like man's anatomical parts and each constituent part linked in the great chain. All citizens of the body were united as a functional whole with a predetermined hierarchy. Order and harmony were maintained because the inherent hierarchy naturally placed each individual in various social positions.

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[73] John Milton, *Paradise Lost*, book 2, introduced by Philip Pullman (Oxford: Oxford University Press, 2005), p.70.

[74] Count Hannibal Romei, Courtier's Academy, translated into English in 1598, quoted from Tillard, *Elizabethan World Picture*, p.103.

It was natural that some were born to rule, and most people's duty was to follow. A man must know his place and duty otherwise he broke the law. Later Hobbes's natural right theory that everyone was equal was alien to this frame. The body politic is thereby maintained when its members "do that thing which is required to the health of the whole."[75] It was thus that natural laws operated to preserve unity and harmony within the divined order. As in the body politic, law and order throughout the universe were instituted for the preservation and sustenance of its members.

Based on these explanations and beliefs, the possibilities of other worlds unrelated to Earth could lead to uncertainty and anxiety. With this in mind, it can better understand why natural magic, alchemy, astrology, and the rise of Hermeticism, Platonism, Pythagorean numerology and other explanatory systems were popular during the period. Indeed, the traditional view was in many ways similar to Christian ideas, which assume a special privileged place in the universe for a particular chosen people. This explains the popularity of the Ptolemaic-Aristotelian system in the Middle Ages. Marjorie Hope Nicolson, in her study of the breakdown of circular theory, noted that the change in terms of the cosmos in the seventeenth century was that an organism was replaced by a machine.[76]

Sir Arthur O. Lovejoy in his seminal work *The Great Chain of Being: A Study of the History of an Idea* showed an attempt to explore the importance of the principle of plenitude and sufficient reason as opposed to scientific considerations.[77] Lovejoy

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[75] Thomas Starkey, Dialogue Between Cardinal Pole and Thomas Lupset (n.d.), quoted in Tillard, *Elizabethan World Picture*. pp.105-06.

[76] Nicolson, *The Breaking of the Circle*, pp.1-2.

[77] Lovejoy, *The Great Chain of Being*, pp.67-99.

explained the contradiction between the metaphysical principle of plenitude and the plurality of worlds concept.[78] The principle of plenitude was defined as "this strange and pregnant theorem of the fullness of the realization of conceptual possibility in actuality."[79] Lovejoy also extended the meaning of the term: "no genuine potentially of being can remain unfilled… that the world is the better, the more things it contains."[80] Thus, Lovejoy emphasized that it was impossible to admit that God could have made a better world because of this principle.[81]

To understand the worldview of the sixteenth-century English, it is reasonable to agree that they believed there was a fully determinate and unchanging cosmos which was constantly revealing itself and was consequently knowable. A social and political order was a reflection of a natural, Godly defined order. It was understood as a correspondent example of natural order rather than the representative of it. An ordered civil society was a reflection of God's divine order and secure humans from disorder and chaos.

Moreover, an ordered society assured order requiring each person to follow and fulfil their duty according to his degree and class. The divine order was the structural source of all private and public institutions as well as of man himself. Proper degree prevailed in the society, in the family, and in the "body politic". As a man's head and body exist together, the king and the Parliament were compared as the head and body of the realm. Sir Thomas Smith described the prince as "the head, life and governor of

[78] Lovejoy, *The Great Chain of Being*, pp.156-158.
[79] Lovejoy, *The Great Chain of Being*, p.52.
[80] Lovejoy, *The Great Chain of Being*, p.52.
[81] Lovejoy, *The Great Chain of Being*, pp.74-6.

this common wealth," while the Parliament was "the whole head and body of the realm of England."[82] This was an understanding of the concept of "King in Parliament." In a word, the commonwealth was as ordered as was divine nature and maintained by duty and degree.

Theorists and politicians of this period believed that there was a fundamental law of nature through which reason could be interpreted or declared. All human law was subject to this law and included the king's.[83] As Richard Hooker said late in the sixteenth century, "where the king doth guide the state, and the law the king, that commonwealth is like a harp or melodious instrument, the strings whereof are tuned and handled all by one."[84]

With the fixed, immutable cosmos that divine order described, man's unique place was secure. "The nature and condition of man, wherein he is less than God Almighty, and excelling not withstanding all other creatures in earth, is called humanity."[85] Not only was man's place in the divine cosmos unique, but also his nature was certain. Within the society which was formed from certain orders of the divine cosmos, man had no conception of "self". Unlike modern society, the notion that individuality was defined and within "self" was quite strange because individuals only existed by one's specifically arranged place in the hierarchical oriented society.

Individuals would not feel isolated or alienated. Man's arranged place in the divine

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[82] Sir Thomas Smith, *De Republica Anglorum*, ed. L. Aston, (Cambridge: Cambridge University Press, 1906), p. 63.

[83] Baumer, Franklin Le Van, *The Early Tudor Theory Of Kingship* (New Haven, Conn.: Yale University Press, 1940), pp.6-10.

[84] Richard Hooker, Of the Laws of Eccleasiastical Polity, *The Works*, ed. J. Keble (Oxford, 1888), 3 vols.

[85] Sir Thomas Elyot, *The Book Named the Governo*r (New York: Teachers College,1970), p.120.

cosmos along with his duty gave him a strong sense of belonging and security in society. The integrated society fulfilled man's need for social satisfaction. This relationship between private and public remained until the last years of the sixteenth century and early seventeenth century. However, the influence of Copernican cosmology caused heated debates about the possibility of other planets with intelligent life from the seventeenth century until the nineteenth century.

The New Expanded Universe

The early modern period has usually been credited with the sudden development of a new scientific revolution interspersed with the revival of the Classics and the quest for humanism. The most seminal works on the changes to the understanding of the cosmos in the seventeenth century are by two historians of science, Alexandre Koyre´ and Thomas Kuhn.

In 1957, in the introduction to Alexandre Koyre´ book entitled *From the Closed World to the Infinite Universe*, he claimed that a very radical spiritual revolution happened in seventeenth century when modern science is the root and fruit.[86] Koyre´ asserted that the impact of the revolution was not only in scientific aspects but in philosophical meaning: "man lost the very world in which he was living and about which he was thinking, and had to transform and replace not only his fundamental concepts and attributes, but even the very framework of his thought."[87] These two aspects together destroyed the hierarchically- ordered cosmos and the concepts of value

[86] Koyre´, *From the Closed World to the Infinite Universe*, p.1.
[87] Koyre´, *From the Closed World to the Infinite Universe*, p.2.

which were based upon it.[88] Koyre´ thought there was a divorce between the world of value and the world of facts, meaning that purpose and harmony have been stripped from the divine cosmos.[89] Seen in this light, this chapter agrees with Koyre´ that the influence of the cosmological revolution has been underestimated.

Published in the same year, Thomas Kuhn's *The Copernican Revolution* served a similar function, but he argued that the cosmological drive did not exist in a vacuum. Instead, humans constructed their "universe" in response to real conditions of social and economic needs. It is possible that certain changes in cosmological thinking occurred in response to material world conditions.[90]

Both authors expressed the same concern, which was what would happen when scientific understandings of cosmological ideas or social conditions changed. After all, humans can only make sense of the world based on their own understanding and control of the material world. If conditions change, then changes in certain cosmological thinking become possible. At some point, scientific developments can testify that the cosmos is different from previous assumptions.

When talking about Scientific Revolution, Copernicus was famous for placing the Sun in the centre of the universe in the astronomical field. His new universe retained elements of both Aristotelian cosmology and Ptolemaic astronomy.[91] For a long time, it was believed that Aristotle-Ptolemy cosmological was linked to anthropocentrism. In order to explore the intellectual impact of the Copernican Revolution, many scholars

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[88] Koyre´, *From the Closed World to the Infinite Universe*, p.2.
[89] Koyre´, *From the Closed World to the Infinite Universe*, pp.2-3.
[90] Thomas Kuhn, *The Copernican Revolution: Planetary Astronomy in the Development of Western Thought* (Massachusetts: Harvard University Press, 1957), p.265.
[91] Koyre´, *From the Closed World to the Infinite Universe*, p.31.

held that the understanding of the scientific revolution was anti-Aristotelian, such as Peter Dear, *Discipline & Experience: The Mathematical Way in the Scientific Revolution*,[92] and Steven Shapin, *The Scientific Revolution.*[93] Peter Dear traced mathematical natural philosophy from the sixteenth century to the English mathematicians in the late seventeenth century. He argued that "geometrical figures were things to be drawn rather than pre-existing in a Platonic realm."[94]

It is generally agreed by Alexandre Koyre´, Thomas Kuhn and many modern scholars that Copernicus' heliocentric theory de-centred the earth within the universe so that the status of humanity received a severe blow.[95] Koyre´ pointed that Copernicus decentred the earth and made it only normal stars in the universe, which destroyed the foundation of traditional divine cosmos.[96]

The philosopher Hans Blumenberg held a different opinion to Koyre´ and Kuhn. In 1975, he explained in his seminal book *The Genesis of the Copernican World* that the overturning of anthropocentrism was by no means Copernicus's original intention.[97] For Blumenberg, that Copernicus replaced the earth by the sun was an internal adjustment to geocentric cosmology.[98] Blumenberg believed that Copernicus reached the heart of cosmos explained that what Copernicus did could be considered as a

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[92] Peter Dear, *Discipline & Experience: The Mathematical Way in the Scientific Revolution* (Chicago: University of Chicago Press, 1995), p.290.
[93] Steven Shapin, *The Scientific Revolution* (Chicago: University of Chicago Press, 1996), p.30.
[94] Peter Dear, *Discipline and Experience: The Mathematical Way in the Scientific Revolution Science and its conceptual foundations.* (Chicago: University of Chicago Press,1995), pp. 8–9.
[95] Kuhn, *The Copernican Revolution*, pp.226-228.
[96] Koyre´, *From the Closed World to the Infinite Universe*, p.29.
[97] Hans Blumenberg, *The Genesis of the Copernican World*, trans. Robert M. Wallace (Massachusetts: The MIT Press, 1989), pp.166-167.
[98] Blumenberg, *The Genesis of the Copernican World*, p.141.

protection against the uncertainties and "Copernicus had concentrated the actual movements of the cosmos into the innermost region thereof. This could be considered as the paradigm of a gain in immanence, a protection of nature against the uncertainties and intrusions of transcendence."[99] Blumenberg used a large number of Classical sources to find evidence in late medieval and Renaissance humanism that geocentrism did not mean anthropocentrism, and anthropocentrism did not mean geocentrism either. He suggested such a connection can only be found in ancient stoicism.[100]

In fact, Blumenberg thought Copernicus eliminated the connection between anthropocentrism and Aristotelianism and geocentrism. He stated, "The provision of the world's continual 'energy requirements' from the outside inward, by way of the mediating agency of the heavenly spheres and all the way down to the terrestrial processes of coming to be and ceasing to be, would have been incompatible with the Copernican implication that the primary motion of the heavens and the path of the Sun were illusory."[101] The "central" position of humanity was "idealized" and was no longer associated with a particular cosmological picture. Therefore, the primary contribution of the Copernican revolution did not lie in the astronomical system or its replacement of a geocentric with a heliocentric cosmology, nor in its theological challenges.[102]

In addition to the developing scientific movement, modern scholars believe that Hermetic tradition played a role in the intellectual revolution during these years as well.

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[99] Blumenberg, *The Genesis of the Copernican World*, p.166.
[100] Blumenberg, *The Genesis of the Copernican World*, p.141.
[101] Blumenberg, *The Genesis of the Copernican World*, p.141.
[102] Blumenberg, *The Genesis of the Copernican World*, p.315.

They both interested in investing the world, searching for knowledge and believing in man's will. These two traditions closely related and positively influenced the general acceptance of secular values, though they ultimately went separate ways. There was a possibility that this change of heliocentrism conversely enhanced the beliefs of the old cosmological model: thus Nicholas Campion believed that Copernicus had been inspired by a Hermetic vision that the sun must stand at the centre of the universe.[103] Campion believed that Copernicus followed the Hermetic tradition that a 'spiritual' sun was the heart of the cosmos. Campion concluded that "it made sense for the [physical sun] to occupy the same space as the [spiritual sun]."[104] This shows that the Copernicus cosmology resembled the traditional divine cosmos, except that he replaced the Earth with Sun. Indeed, this change probably enhanced the power of the traditional cosmology.

According to Frances Yates, there was a resurgence of mystic associations for the sun in the Renaissance.[105] Yates stated, "Copernicus's quotation from 'Trismegistus', after his diagram of the Solar System, shows that he had absorbed the Hermetic Sun mysticism, combined with Neoplatonism, which was the characteristic philosophy of his time."[106] This theory put man's supposed centrality on a fixed and centred position in the universe as Earth used to be. It did not greatly alter the philosophical meaning of

[103] Nicholas Campion, *A History of Western Astrology*, Vol 1, (London: Continuum,2009), p.110.
[104] Campion, *A History of Western Astrology*, p.110.
[105] Yates, *Giordano Bruno and the Hermetic Tradition*, p.202.
[106] Frances A. Yates, *Selected works. Ideas and ideals in the North European Renaissance*, Volume X (London: Routledge, 1999), p.259.

the old Aristotelian-Ptolemaic cosmology. The Hermetic tradition emphasis a new means to seek a defined and created order.

By moving the Earth out of the centre, Copernicus's universe conflicted with the basis of Aristotelian physics, the division between the terrestrial and celestial regions. It also conflicted with the Christian doctrine of the stationary Earth. As a result, most sixteenth-century astronomers did not accept the heliocentric hypothesis, but rather used Copernicus's calculations as only a mathematical method in order to correct the calendar rather than a revolution in cosmology. As discussed in Chapter one, Copernican theory in the Elizabethan era was not yet an accepted system of the world. Robert S. Westman notes that no more than ten thinkers between 1543 and 1600 agreed with the "main claims" of the heliocentric theory.[107]

In November of 1572, an alarming event occurred: a new star appeared in the sky.[108] According to the belief system of early modem England, such a phenomenon was impossible. This was a huge shock to English with a direct question: how could something new appear in a supposedly changeless superlunary region of Aristotle's universe.[109] Raphael Holinshed, an early-modern English historian, recorded the anxiety over the discovery in his 1587 *Chronicles*: the appearance of a new star "in place celestiall far above the moone" was "so strange, as from the beginning of the world never was the like."[110] Johnson noted that the new star "helped to remove one

[107] Robert S. Westman, ed., T*he Copernican Achievement* (Berkeley and Los Angeles: University of Calif. Press, 1975), p.106.
[108] Johnson, *Astronomical Thought in Renaissance England*, p.154.
[109] Johnson, *Astronomical Thought in Renaissance England*, p.155.
[110] Donald W. Olson, Marilynn S. Olson, and Russell L. Doescher, "The Stars of Hamlet," *Sky and Telescope*, no.5, 1998, p.71.

of the chief obstacles to the progress of the Copernican hypothesis," which was Aristotle's celestial divisions.[111]

In 1577, another shocking astronomical event occurred: Tycho discerned that an extremely bright comet had appeared in the sky, which must be located beyond the Moon's sphere.[112] This comet raised doubt concerning the existence of the old immutable cosmology.

This paper assumes that what was much more unsettling in the new world system was a concept of "plurality of worlds". This could cause a mixed feeling of anxiety and alienation. In this view, separated from the assumption of geocentrism, the possibility of a "plurality of worlds" became available in constructing the new worldview. When the Copernican revolution challenged the Aristotelian-Ptolemaic system in the early modern era, the possibilities of other worlds caused a shift of perspective: humans lost a fixed and central position from which to observe the universe.[113] There was a crucial step in the transformation from earlier thought to the development of humans' self-assertion in their relationship with the natural world.

The central question can be posed thus: in a universe which was proved to be infinite, how could humans think and know about the outside world? What could humans think, and how could humans come to know anything about the universe in which they found themselves? As a result, the natural world would become a dangerous place and other disasters would cause a continual fear of death or feeling that the world

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111 Johnson, *Astronomical Thought in Renaissance England*, p.160.
112 Antonia McLean, *Humanism and the Rise of Science in Tudor England* (London: Heinemann, 1972), p.146.
113 Patomaki, Heikki, "Cosmological Sources of Critical Cosmopolitanism", *Review of International Studies*, vol. 36, no. S1, 2010, pp.181–200.

was beyond human control. H. R. Trevor-Roper in *The General Crisis of The Seventeenth Century* examined intellectual crises, such as fear of the end of the world, shared by wider European society during this period.[114]

The poetry of John Donne may be cited as symptomatic of an age of "uncertain signs":

And new Philosophy calls all in doubt,
The Element of fire is quite put out;
The Sunne is lost, and th'earth, and no mans wit
Can well direct him, where to looke for it.
And freely men confesse, that this world's spent,
When in the Planets, and the Firmament
They seeke so many new: they see that this
Is crumbled out againe to his Atomis;
'Tis all in pieces, all cohaerence gone;
All just supply, and all Relation:
Prince, Subiect, Father, Sonne, are things forgot,
For euery man alone thinkes he hath got
To be a Phoenix, and that there cam bee
None of that kinde, of which he is, but hee.[115]

This poetry showed a general sense of disorder and the breaking down of the hierarchical social order.[116] It pointed out that the sun and the earth were "lost", and "many new" planets were found in an infinite universe; "atomis in motion" showed the mechanical operation of nature; the organism was "all in pieces"; internal qualities were replaced by mechanical explanations; "supply", "relation". This metaphorical shift implicated a full range of imaginative, speculative, and political thought.

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[114] Hugh Trevor-Roper, "The General Crisis of the Seventeenth Century", *Past and Present*, Volume 16, Issue 1, 1 November 1959, pp.31–64.

[115] John Donne, *The Anniversaries*, ed. Frank Manley (Baltimore: The John Hophins Press,1963), pp.73-74.

[116] Nicolson, *The Breaking of the Circle*, p.120.

Another consequence which arose was that supernatural forces played a more immediate and important role in societies gaining faith in controlling the environment. Keith Thomas in *Religion and the Decline of Magic* described the prevalence of magic and the supernatural in early modern England.[117] Yet, Thomas suggested magic and astrology declined by the end of the seventeenth century. He explained this by stating that: "What really destroyed the possibility of scientific astrology was the undermining of the Aristotelian distinction between terrestrial and celestial bodies, what Bacon called 'the imaginary divorce between superlunary and sublunary things.'"[118] It is suggested that developments in astronomy influenced humans' views of nature. In order to preserve humans' status and dignity, internal adjustments were made by theologians and philosophers in the seventeenth century. This is a very important point which will be considered later.

This transformation can be seen in literature as well. In the early seventeenth century, writers wrote with mixed feelings of fear, anxiety and thrill about the other worlds. It can be seen again from John Donne's poetry, *An Anatomy of the World: The First Anniversary*[119] and *Ignatius His Conclave*[120], both written in 1611; and *Of the Progress of the Soul, the Second Anniversary* written in 1612.[121] In these poems, Donne showed his concern about the new universe modified by Copernicus's followers instead of the old Aristotle-Ptolemy cosmos. In addition, he described the new

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[117] Keith Thomas, *Religion and the Decline of Magic*: *Studies in Popular Beliefs in Sixteenth a nd Seventeenth Century England* (London: Weidenfeld&Nicolson,1971), p.140.
[118] Thomas, *Religion and the Decline of Magic*, p.349.
[119] John Donne, *An Anatomy of the World: The First Anniversary*, 1611.
[120] John Donne, *Ignatius His Conclave*, 1611.
[121] John Donne, *Of the Progress of the Soul, the Second Anniversary*, 1612.

philosophy which threatened to separate the divine cosmos and metaphysical, expanded universe.[122]

However, in the mid-seventeenth century, the stories of travels to the moon became popular and were a way of exploring other possible ways of living. Indeed, seventeenth-century astronomer and mathematician Johannes Kepler wrote about just such a journey.[123] Some thinkers already started to picture colonizing the moon, which reflected what Cassirer called the "historical consciousness."[124] Francis Godwin, John Wilkins, Athanasius Kircher, Samuel Brown, Ludvig Holberg, and Margaret Cavendish are all further examples.

In Elizabethan England two scholars accepted and developed Copernicus's theory: Thomas Digges and Giordano Bruno. Digges added his 1576 *A Perfit Description of the Caelestial Orbes* to a revision of his father's *Prognostication Everlasting.* According to Alexandre Koyre´, Digges significantly modified Copernicus's universe. Digges reproduced Copernicus's original cosmos and added numerous stars beyond that final circle. He thus presented an infinite universe.[125] Some scholars argued that Digges was the first modem astronomer to expand an infinite heliocentric universe beyond Copernicus himself.[126]

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[122] Lisa Gorton, "John Donne's Use of Space", *Early Modern Literary Studies* 4.2, Special Issue 3, September 1998, pp.1-27.

[123] Howard E. McCurdy, *Space and the American Imagination* (Baltimore: The Johnson Hopkins University Press, 2011), p.13.

[124] Ernst Cassirer, *The Individual and the Cosmos in Renaissance Philosophy*, p.166.

[125] Koyre´, *From the Closed World to the Infinite Universe*, p.35.

[126] See Johnson, *Astronomical Thought,* pp.164-65, 168; McLean, *Humanism and the Rise of Science in Tudor England*, pp.146-47; Dorothea Waley Singer, *Giordano Bruno, His Life and Thought: With Annotated Translation of his Work On the Infinite Universe and Worlds* (New York: Greenwood, 1968), p.64.

Bruno also had an influence on English thought. In England, Bruno published six of his philosophical/cosmological treatises and supported a universe composed of plurality of worlds within an infinite space.[127] In particular, he explicated how Copernican theory functioned as the basis for his cosmology in his 1584 *On the Infinite Universe and Worlds.* "There are then innumerable suns, and an infinite number of earths revolve around those suns, just as the seven we can observe revolve around this sun which is close to us."[128] Unlike the ordered, hierarchical space of either Aristotle's or Copernicus's cosmos, Bruno's cosmos is an acentric and homogenous space.

In 1638, the future English Bishop and founder of the Royal Society of London, John Wilkins, wrote in *The Discovery of a World* that "having read Plutarch, Galileus, Kepler, with some others, and finding many of mine own thoughts confirmed by such strong authority, I then concluded that it was not only possible there might be, but probable that there was another habitable world in that planet."[129] This was a fearless suggestion that the universe contains a plurality of worlds. Wilkins explained why this conclusion does not contradict the Christian faith.

Copernicus's heliocentrism caused both a spatial and theological transformation of the universe by generating a new concept of space where humankind is no longer in the centre. Wilkins's work demonstrated the anxieties brought by the possibility of plurality of worlds. There was a theological paradox to which Wilkins admitted he has

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[127] Paul Henri Michel, *The Cosmology of Giordano Bruno,* trans. R. E. W. Maddison (Paris: Hermann, 1973), p.16.
[128] Giordano Bruno, *De Vinfmito universo emondi,* in vol. 2, *Opere Italiane di Giordano Bruno* (Torino: Unione Tipografico-Editrice Torinese, 2002), p.89. Translation by Singer in *Giordano Bruno,* p.304.
[129] John Wilkins, *The Discovery of a New World, or, A Discourse Tending to Prove, that (it is Probable) There May be Another World in the Moon* (London: Printed by *E. G.* for *Michael Sparl* and *Edward Forrest*, 1638), p.12.

no solution, which was the salvation of extraterrestrial life. If it is human, humans in Earth would lose the unique relationship to God which was wrote as a doctrine in Christian. Moreover, it could diminish the unique and valuable of Christian salvation on Earth.

Two natural philosophers, Johannes Kepler and Galileo Galilei, further improved Copernicus's view. Kepler's *The Dream,* written by 1609, depicted the first Moon-world in a Copernican universe; and Galileo's telescopic observations, published as *The Sidereal Messenger* in 1610, verified the similarities between the Earth and the Moon.

Johannes Kepler published his theory *The Dream, or Posthumous Work on Lunar Astronomy* in 1634. It implicitly denied Aristotle's single-world universe, since Kepler presented a universe comprised of multiple worlds. However, Kepler attempted to maintain the centrality of humanity in a plural-worlds universe. Johannes Kepler perceived the geometry of the cosmos and viewed the universe in terms of a celestial symphony orchestrated by "harmony of the spheres."[130]

Kepler explained that the Earth's position within this ordered, closed universe accounts for its status as the most "noble" of the planets[131]: "his system of planets, on one of which we humans dwell, is located in the very bosom of the world, around the heart of the universe, that is, the sun. These arguments will also establish in particular that we humans live on the globe which by right belongs to the primary rational creature, the noblest of the (corporeal) creatures. "[132] Kepler supposed that this cosmos could

[130] Quoted from E. M. W Tillyard. *The Elizabethan World Picture: A Study of the Idea of Order in the Age of Shakespeare. Donne and Milton* (New York: Pelican Books, 1972), p.109.
[131] Johannes Kepler, *Dissertatio cum nuncio sidereo.* Vol. 4, *Gesammelte werke.* ed. Walther von Dyck and Max Caspar (Munich: C.H. Beck, 1937-1998), p.309.
[132] Kepler, *Dissertatio*, pp.307-308.

show the uniqueness of the Earth and allowed human beings to retain their significance in an expanded universe.

Thus, in the *Dissertatio,* Kepler proposed that Galileo's findings did not confirm Giordano Bruno's theory of a universe with plurality of worlds was a relief.[133] He believed that an infinite universe would be a space without order and cause fear. "If you [Galileo] had discovered any planets revolving around one of the fixed stars, there would now be waiting for me chains and a prison amid Bruno's innumerabilities… you have for the present freed me from the great fear which gripped me as soon as I had heard about your book from my opponent's triumphal shout."[134] Kepler believed that God made this arrangement and the natural world was an expression of Him. Therefore, Kepler warned Galileo that he denied multiple solar systems in Bruno's universe as it could cause chaos and disturb God's plan.

In fact, Galileo's *Sidereus nuncius* included two revolutionary discoveries. The first was his description of the surface of the Moon: "Anyone will then understand with the certainty of the senses that the Moon is by no means endowed with a smooth and polished surface, but is rough and uneven and, just as the face of the Earth itself, crowded everywhere with vast prominences, deep chasms, and convolutions."[135] In Aristotle's cosmology, the moon should have appeared perfectly smooth and spherical. Instead, it was perceived to be imperfect like the Earth.

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[133] Koyre´, *From the Closed World to the infinite universe*, p.58.
[134] Kepler, *Dissertatio,* 304; Rosen, *Kepler's Conversation*, pp.36-7
[135] Galileo Galilei, *Sidereus nuncius*, translation by Albert Van Helden (Chicago: Chicago University Press, 1989), p.5V.

Galileo's second discovery was the observation that Jupiter has four moons, which he describes as "four planets never seen from the beginning of the world right up to our day."[136] It is interesting to note that Galileo assumed these conditions to be natural, which was quite different from the old animated cosmos model. Both discoveries supported Copernican theory, but they also implicated that all other planets might be Earths and thus may contain intelligent life.[137]

Later in the century, another prominent figure appeared: René Descartes. Steven J. Dick asserted that "Cartesian cosmology played a central role in extending the idea of a plurality of Earthlike planets to that of a plurality of solar systems."[138] Arthur O. Lovejoy wrote that "even learned authors" gave Descartes "the whole credit" for the new cosmology that time.[139] Conceptions of an expanded universe had begun to enter the English consciousness by the 1640s. As Steven Shapin notes, Cartesian mechanics influenced key English natural philosophers such as Thomas Hobbes and Robert Boyle.[140]

Descartes' cosmos is a space composed only of matter and motion, which exhibits Descartes' mechanical worldview.[141] In Descartes' body/soul (or mind) dualism, all things are composed of either matter or soul. Matter accounts for the physical or natural

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136 Galileo, *Sidereus nuncius*, p.17R.

137 Nicolson notes that Galileo denied the possibility of the existence of inhabitants on the Moon, and was ambiguous about the possibility of life on other planets. "The Telescope and Imagination", in *Science and Imagination*, 25, note 38.

138 Dick, *Plurality of Worlds*, p.126.

139 Lovejoy, *The Great Chain of Being*, p.125.

140 Shapin, *The Scientific Revolution*), p.44. Descartes' works, furthermore, were translated into English from the late 1640s, beginning with a translation of the *Discourse on Method* in 1649. Sterling P. Lamprecht, "The Role of Descartes in Seventeenth-Century England", *Studies in the History of Ideas* 3 (1935), p.193.

141 Peter Dear, *Revolutionizing the Sciences: European Knowledge and Its Ambitions,1500-1700* (Princeton: Princeton University Press,2001), pp.84-86.

world. Soul accounts for the nonphysical or "thinking stuff."[142] As a result, Descartes' universe cannot contain a vacuum; it must be a plenum. In his 1644 *Principles of Philosophy,* Descartes describes the physical nature of a universe full with particles and each vortex had a centre.[143] Descartes identified each vortex with a Copernican solar system, which means each had a central Sun surrounded by its own planets. Descartes replaced the "animistic explanation of the motion of the spheres" with "a purely mechanical impulsion."[144] The planets rotate not because of an internal innate force, but because of the physical nature of the construct of the universe.[145]

Yet, Descartes keeps God central with his mechanical explanation for planetary motion. Descartes believed that "the motion of bodies in the world derive[d] directly from God himself."[146] Descartes himself claimed, "there are as many different vortices as there are now stars in the world."[147] Consequently Descartes presented a universe with a potentially infinite number of solar systems, though he did not state his belief in either an infinite universe or a plurality of worlds. Because he thought "infinite" can apply only to God.[148] Despite this, Descartes' theory arguably provides the basis for such a universe.

Furthermore, for Descartes, space and matter are the same thing, and therefore a vacuum is an impossibility. Descartes' universe, in effect, is infinitely extended and

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142 Dear, *Revolutionizing the Sciences,* p.89.
143 René Descartes, *Principles of Philosophy*, (Montana: Kessinger Publishing,2010), p.108.
144 E. J. Aiton, *The Vortex Theory of Planetary Motions* (London: MacDonald,1972), p.5.
145 William Donahue, "Astronomy", *The Cambridge History of Science: Early Modem Science,* vol. 3, ed. Lorraine Daston and Katharine Park (Cambridge: Cambridge University Press,2006), p.588.
146 Dear, *Revolutionizing the Sciences*, pp.84-85.
147 René Descartes, Principles of Philosophy, (Montana: Kessinger Publishing,2010), p.109.
148 Dick, *Plurality of Worlds,* p.107.

thus composed of an infinite number of solar systems. Moreover, Descartes believed in the "uniformity of Nature's laws"; the laws of Nature are essentially the same across the universe, since the universe is composed of the same material throughout.[149] No wonder that the Queen of Sweden Christina observed that Descartes's cosmology could lead to the belief that "all these stars have inhabitants" and perhaps even that "they have earths around them."[150]

The early influence of Descartes in England is particularly evident in the work of Henry More. It is believed that More was the first to introduce Cartesian thought to England. More's 1646 poem *Democritus Platonissans, or An Essay upon the Infinity of Worlds out of Platonick Principles* was likely one of the first published discussions of Descartes' philosophy in England.[151] Descartes' cosmology underlies the entire poem. More wrote on the preface that "Epicurus, Democritus, Lucretius" as well as "*That sublime and subtill Mechanick* […], Descartes."[152]

Then More affirmed the infinity of worlds in infinite space: "These [planets] with their suns I severall worlds do call, Whereof the number I deem infinite: Else infinite darknesse were in this great Hall Of th' endlesse Universe; But if that infinite Suns we shall admit, Then infinite worlds follow in reason right."[153] More's poem indicated that Descartes' philosophy was entering the English consciousness. Influenced by Descartes'

[149] Dick, *Plurality of Worlds,* p.111 and p.140. Quote on p.111.
[150] Dick, *Plurality of Worlds,* p.112.
[151] Marjorie Nicolson, "The Early Stage of Cartesianism in England", *Studies in Philology* 26, no.3,1929, pp. 356-74.
[152] Henry More, *Democritus Platonissans, Or An Essay Upon The Infinity of Worlds out of Platonick Principles,* in *A Platonick Song of the Soul,* ed. Alexander Jacob (Lewisburg: Bucknell University Press, 1998), p.403.
[153] More, *Democritus Platonissans,* p.413.

cosmology, More "enthusiastically urged upon the English-speaking world the belief in an infinite number of inhabited planets" in an infinite space.[154] Lovejoy concluded that it was likely the "Cartesianism led to "the rapidly growing acceptance of the theories of the plurality and infinity of worlds in the second half of the seventeenth century."[155]

However, the mechanical worldview with an infinite universe could cause a threat to theology. Matter becomes passive without active, internal forces. More found that "the Cartesian world in practice excluded spirits and souls."[156] Descartes' universe seems to deny Aristotelian final cause, the God's greater purpose for the universe. Shapin notes that Descartes in fact "formally banished talk of final causes from his natural philosophy."[157] The expanded universe with a plurality of worlds has the potential to be a disordered world. Since the English conception of the expanded universe was connected to Descartes' cosmology, it seems reasonable that Thomas Hobbes could follow this universe. It is a mechanical world that seems to lack the absolute monarch, God.

Political Thinking Before Thomas Hobbes

Twentieth-century theorists like T. S. Kuhn used paradigm theory to explain the scientific revolution. There are basic values and beliefs in sustaining the paradigm. Kuhn asserted that the usual response to the initial conceptual breakdown in the old

[154] Dick, *Plurality of Worlds*, p.117.
[155] Lovejoy, *Great Chain of Being*, pp.124-125.
[156] Alan Gabbey, "Philosophia Cartesiana Triumphata, Henry More (1646-1671)," *Problems of Cartesianism*, ed. Thomas M. Lennon, John M. Nicholas, and John W. Davis (Kingston: McGill - Queen's University Press, 1982), p.174.
[157] Shapin, *Scientific Revolution*, p.148.

paradigm is conservative. Efforts are made to validate and revalidate the traditional ordering of things. In this way, the initial breakdown is overlooked, and the causes of disorder are disregarded. Only later when a new ordering of things emerges, and only after sufficient battle, then a new paradigm can be created.[158]

The understanding of values, paradigms and paradigm shifts is about explaining changes in the scientific world along with the political world. An analysis of this shift linking these two areas lies in the transformation in the basic conceptions.[159] Conceptions of the self, of society, and of the larger cosmos which was extended to an infinite universe and of the relationships among all of these, describe a new idea of political order.

The ancient Greek philosophers Plato and Aristotle successfully constructed the metaphysics of cosmos by eliminating infinite space and the possibility of a plurality of worlds.[160] In the Middle Ages, the concept of infinity was a paradox. On the one hand, infinity was combined with the concept of the omnipotence of God. On the other hand, an infinite universe with a plurality of worlds could demote the unique place of the human being.[161] The reappearance of infinity in a positive form because of the scientific revolution was destructive to the old system.

Without this "organic and hierarchical interpretation of system" as described, the traditional world view "precluded any sort of independent political aspiration or

[158] Kuhn, *The Copernican Revolution*, pp.86-87.
[159] Kuhn, *The Copernican Revolution*, pp.89.
[160] Hans Blumenberg, trans Robert M. Wallace. *The Legitimacy of The Modern Age* (Baskerville: MIT press, 1991). p.79.
[161] Blumenberg, *The Legitimacy of The Modern Age*, pp.79-80.

initiative." and had become foundationless.[162] General concern and discussion about the relationship between law, authority and sovereignty increased. At the same time, theorists started gradually to think about the relationship between public, social values and private desires. Different political theories advanced innovative concepts of order and authority and began to define a political and a conceptual relationship between order and secular sovereignty.

As Walzer has argued "The changing nature of the political world was, however, paralleled by changes in the conception of the cosmos. . . These changes in the view of God and his universe had many sources. Calvinism was among the most important."[163] Walzer tried to find a reason for the dissolution of the traditional, hierarchical view of things in the Puritans' ubiquitous involvement in Sin and the Fall; it "produced descriptions of chaos which sounded very much like Hobbes' view of nature. And if chaos were natural, there was no great chain."[164]

Indeed, in the old divine Christian cosmos, the view was one of an unchanging political order in which "politics ought never to be the concern of private men."[165] The cosmic chaos resulted in basic values about man, society, God and the cosmos being challenged consciousness. Walzer argued that the Puritan politics reacted against this chaos;[166] this thesis assumed that the basis of Hobbes' new secular sovereignty started from this cosmic chaos. Early in his career, Hobbes argued "the estate of men in . . .

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[162] Michael Walzer. *The Revolution of the Saints: A Study in the Origins of Radical Politics* (New York: Atheneum,1971), p.8.

[163] Walzer, *The Revolution of the Saints,* p.160.

[164] Walzer *The Revolution of the Saints*, p.159.

[165] Walzer *The Revolution of the Saints*, p.121.

[166] Walzer *The Revolution of the Saints,* p.161.

natural liberty is the estate of war."[167] The state of "war" (chaos) was the starting point of Hobbes's political legitimacy and the political nature of man.

The consciousness of practical and efficient order supported new conceptions of man and state during the middle years of the seventeenth century. Even for those who accepted the Copernican universe, epistemological consequences could not be foreseen. Once the earth became only one of many planets it would lose its distinct status with the heavens and the hierarchy would devalue. Man, decentered with the earth, must search for a new place in the cosmos.

During the first half of the seventeenth century, King James I, Edward Forset, and Sir Robert Filmer were famous for articulating the divine right theory, which accorded with the organic and hierarchical cosmology. The divine right theory grew in response to a practical necessity rather than intellectual activity. Theories of divine right grew to refute the control of religion over royal sovereignty.[168] It might be useful to understand this concept as an innovative response to the breakdown in the traditional order, and consequently related in terms of theories of popular responsibility and sovereignty.

King James suggested to his Parliament in 1609, "if you wil consider the Attributes to God, you shall see how they agree in the person of a King."[169] Kings are divine because they are like God who rules the whole universe by natural hierarchy.

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[167] Thomas Hobbes, *Elements of Law Natural and Politic: Part I Human Nature, Part II De Corpore Politico with Three Lives*, Edited with an Introduction and notes by J. C. A. Gaskin (New York: Oxford University Press, 1994), p.80.

[168] James, Daly, "Cosmic Harmony and Political Thinking in Early Stuart England", *Transactions of the American Philosophical Society*, vol. 69, no. 7, 1979, p.13.

[169] James I, "The Trew Law of Free Monarchies: Or The Reciprock And Mutuall Duties Betwixt A Free King, and His Naturall Subjects," in *The Political Works of James I*, intro, and ed. C. H. Mcllwain (Cambridge;Mass.: Harvard University Press, 1918), p.54.

Additionally, James believed that kings ruled the country as the father ruled his family and the head of the body politic in microcosm.[170] From this, James argued that kings are accountable to God. James maintains that God's law was perfect and ultimately fixed and all laws derived from it.[171] Therefore the King's authority for order and his power from a divine ordination.

Edward Forset published *A Comparative Discourse of the Bodies Natural and Politique* to support the divine right theory. Borrowing from the cosmology of Pico, Bruno and John Dee, who suggested that God's full, created universe was infinite and various. Forset established the political order that transcended traditional hierarchies and defined man's place in both the natural and the political orders. He wrote in the introduction that "In the very composure of man, there is manifestly discovered a summary abstract of absolute perfection, by the which as by an excellent Idea, or an exact rule, we may examine and exemplifie all other things."[172] The relationship between man and the cosmos still existed, but this is a new way of admitting man's responsibility for discovering order. Man's chosen purpose was to interpret God's cosmos by discovering natural relationships. "It is the greatest miracle of God's powerfull wisdome, in the innumerable frames of things to make infinite variation; then it must needs be a great work of the wit of man, in such multiplicitie of differance to find out the well agreeing resemblences."[173] Men created political order by imitating and by establishing a fixed order which resembled God's natural order.

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[170] James I, "Speech to Parliament,1609," p.307.
[171] James I, "Basilikon Doron," p.11.
172 Edward Forset, *A Comparative Discourse of the Bodies Natural and Politique* (London: Printed for John Bill, 1606), p.1.
[173] Forset, *A Comparative Discourse of the Bodies Natural and Politique*, p.1.

Forest advanced a traditional theory of order which required the dynamic exercising of self-consciousness and of individual responsibility. He did not use theological argument, instead, he based his theory of order upon a modified cosmology of Pico, Bruno and John Dee. In so doing, he tied the purpose of order more tightly to temporal definition, but restricted it to an organic cycle.

The awareness of change and alteration and the possibilities of infinite universe intensified. For instance, Raleigh believed that "There is nothing exempt from the Peril of Mutation; the Earth, Heavens, and the Whole World is thereunto subject."[174] The whole world, including even Heavens, decay was destiny. This is a clear difference from the old Christian cosmos. Theorists rarely think about the state from the first causes and principles because the primary task was what a state can provide. Apparently, there is a parallel between changes in political philosophy and natural philosophy during these years.

Unlike James, Forset, or Raleigh, Bacon seems to see politics and political theories more practical. Within the tradition of the Renaissance Neoplatonic cosmology, Bacon saw that "matter is in a perpetual flux, and never at a stay."[175] Bacon admitted that change was endless, but man could manage to order change. Bacon complemented a full materialistic cosmos. Besides, he derived his idea of the state and order from this understanding. Bacon found his way in Neoplatonic-Hermetic tradition associated with

[174] Sir Walter Raleigh, *The Works of Sir Walter Ralegh, Kt. Political, Conmercial, and Philosophical; Together with his Letters and Poems*, vol1 (London: Printed for R. Dodsley, at Tully's Head in Pall-mall, 1751), pp.93-94.
[175] Francis Bacon, *The Works of Francis Bacon, Lord Chancellor of England*, with a life of the author by Basil Montagu ESQ. 3vols, vol1 (Philadelphia: Carey and Hart, 1841), p.60.

Pico.[176] He emphasised the study of the full cosmos which were wisdom and knowledge from ancients. By combining knowledge and wisdom within the finite and mysterious cosmos, Bacon attempted to recover order, especially state and social order.

Yet Bacon tried to define the secular world rather than a transcendental purpose. He understood that the centre of man's life in the secular world is to construct a system of order, just as the traditional theorists had defined and mythologized the divine cosmos around which their lives revolved. The traditional arguments about order and degree were used to construct the security of society. In this respect, Bacon smoothed the way to a rational consciousness of self that Hobbes used to his political definition.

Throughout his Essays, Bacon, like Hobbes, advocated a careful appraisal of one's nature which led to success in temporal endeavours. He asserted that habits and actions were the best means of understanding politics and business.[177] For Bacon, "…the well understanding and discerning of a man's self" was a prerequisite to involve in the secular world.[178]

In agreement with Bacon, Tuvil realized that an understanding of man's nature facilitated the successful consummation of individual endeavours. But he recognized that to gain true and certain knowledge of man was extremely hard and difficult.[179] He noted that man could not judge things according to preconceived ideas of justice, or expect things always to be reasonable. His understanding of the relationship between

[176] James, Daly, "Cosmic Harmony and Political Thinking in Early Stuart England", *Transactions of the American Philosophical Society*, vol. 69, no. 7, 1979, p.15.
[177] Francis Bacon, "Advancement of Learning", *The Works of Francis Bacon*, ed. James Spedding, R. L. Ellis and D. D. Heath, (London, 1857-1859), p.460.
[178] Francis Bacon, *The Works of Francis Bacon, Lord Chancellor of England*, p.234.
[179] D. Tuvil, *Essais Politicke and Morall* (London: 1608), p.115.

passions, will and reason undermines the concept of right reason and required purpose and ultimate ends of private and public activity.

Tuvil based his account of political theory upon a psychology of human ethics which indicated Hobbesian insights in many places.

> "Passions are certaine internal acts, and operations of our soul, which being joyned and linked in a most inviolable, and long continued friendship with the sensitive power, and facultie thereof, doe conspire together like disobedient and rebelious subjects, to shake off the yoake of Reason, and exempt themselves from her commaund & controlement, that they may still exercise those disordered motions, in this contract world of our frayle and humaine bodies."[180]

The internal motivations which directed man's actions was the knowledge of self. This kind of knowledge led to the knowledge of society. For Turvil, this showed that man become the primary consideration in a world motive behaviour influenced political world. Therefore, it is clear that he abandoned the body politic and the human body correspondent to natural order and divinity. Earlier than Hobbes' concepts of "appetites" and "aversions," Turvil realised that man's behaviour was motivated by simple internal passions rather than external defined purposes. "Tis eyther hope of Reward, or feare of Punishment, that in the attempt of things, orders and directs our choyce."[181]

The understanding of the particular and the purposive nature of man needs to re-evaluate the foundation for action, behaviour, value, and purpose. Man's concept of himself and his understanding of his relationship to external world could cause chaos in political order. Man had to take responsibility for his own actions.[182] The identity was no longer secured by cosmic correspondence. Instead, man had to find value for

[180] Tuvil, *Essais Politicke and Morall*, pp.15v-16r.
[181] Tuvil, *Essais Politicke and Morall*, p.125.
[182] Cassirer, *The Individual and the Cosmos in Renaissance Philosophy*, p.20.

himself in the secular world; and to do this he had to work to establish similar self-defined ends for man and for society. Otherwise, man would experience emotional isolation and uncertainty in order.

However, it is a difficult task to combine self with political order. Seventeenth-century theorists faced a dilemma. One the one hand, they had a mixed feeling towards the self-consciousness: both proud and feared. The best example of this feeling probably was in the works of Shakespeare. On the other hand, the private and commonwealth needed a new relationship.[183] In this respect, Hobbes believes that good and bad actions were similarly motivated and all cause and effect emanated from the one nature; consequently, to secure order in a changing world could not only depended on moral codes. Therefore, it was necessary to address the definition and limitations of sovereignty, namely the order in a changing secular world. Hobbes provided a conservative cosmological foundation for a developed self-consciousness, a new understanding of the power and limits of knowledge, and a changed view of nature to help shape and boundaries.

The new cosmological system defines the relationship between self and society which generally altered the traditional divine cosmos. As was the case with changes in political theories, these alterations interest in man's will and were often inspired by religious and philosophical traditions that gained structural definition from the divine cosmos. Divinity had most perfectly accomplished this unity in nature.

The cosmos that magicians and philosophers worked in and contemplated

[183] Cassirer, *The Individual and the Cosmos in Renaissance Philosophy*, p.31.

resembled that of the traditional order.[184] However, it functioned to celebrate human possibilities that transcended these same structural natures. It investigated the world; the search for knowledge and the concern with the power of knowledge characterized the English imagination and the English political world during these years. Man could imitate divinity and could attain the divine knowledge of this unity in love or by properly understanding nature and operating in it.

Changing conceptions about nature, knowledge, magic, and science characterized the profound emphasis on political order and provided some theorists with viable means with which to confront a social world to defend by change. Then it arouses a new problem: the ability to tap the reforming power of knowledge depended on the method used to gain knowledge.[185] It served as a bridge to connect man and knowledge. The proper inquiry into nature reformed man and emancipated him from the limits of his perspective. He was then capable of redefining society according to its natural investigation ability.

In this regard, Bacon paved a way for Hobbes. For Bacon, knowledge was a useful tool for man to manipulate and direct nature. As did so many of his contemporaries, he continually struggled with questions of permanence and change; and his ordered universe contained eternal matter which was ever in flux. Bacon declared "the true ends of knowledge is for the benefit and use of life."[186] The reform of knowledge would be the effective cause of the reform of political world. By careful observation, man could

[184] Yates, *Giordano Bruno and the Hermetic Tradition*, p.144.
[185] Cassirer, *The Individual and the Cosmos in Renaissance Philosophy*, p.35.
[186] Francis Bacon, *The Philosophical Works of Francis Bacon*, ed. John H. Robertson (London: Routledge, 2011), p 247.

participate in nature's essential order and resurrect the natural union of mind and nature.

His method for knowing resembled Hobbes': "Those however who aspire not to guess and divine, but to discover and know; who propose not to devise mimic and fabulous worlds of their own, but to examine and dissect the nature of this very world itself: must go to the facts themselves for everything."[187] Bacon believed that man's mind could reflect reality and conceive order, but man shall destroy the false knowledge and worlds. Then Bacon believed that "wedlock of mind and universe" recur.[188] Bacon criticized the ancient opinion that man was a microcosm by exaggerating the correspondences and parallels with the macrocosm.[189]

Bacon did not praise first cause as the traditional theorists did, but defined order as a simple existence of unchanging physical laws. As Bacon stated: "Towards the effecting of works, all that man can do is to put together or put asunder natural bodies."[190] This was an important insight because it allowed man to define things. In this regard, Bacon conservatively rejected traditional notions of nature's autonomy over order, and prefigured the new concepts concerning nature, society and order. Hobbes articulates this point which will be discussed later. The understanding of nature and of man helped define a new idea of order which no longer described a divine cosmos corresponding to man's microcosm; rather, the order was social reality itself, shaped and framed by human will and action.

Finally, Bacon's world was a fully material, finite and changing universe. Bacon

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[187] Bacon, *The Philosophical Works of Francis Bacon*, p.251.
[188] Paolo Rossi, *Francis Bacon: From Magic to Science* (Chicago: University Press, 1968), p.163.
[189] Bacon, "Advancement of Learning," pp.111-395.
[190] Bacon, "Aphorisms," chapter 4, p.47.

asserted that natural philosophy turned to human affairs and conditioned the ideas of harmony, virtue and peace in man. Since natural philosophy "teaches the peoples to assemble and unite and take upon them the yoke of laws and submit to authority, and forget their ungoverned appetites."[191]

With Hobbes, Bacon understood that order was necessary. Unlike the old divine cosmos which asserted that disorder was unnatural, it is a struggle for Bacon to admit that both order and disorder were natural. Bacon claimed that civilization flourishes and decays like nature; then rebellions break out and finally "according to the appointed vicissitude of things," civilization again arises" not in the places where they were before.[192] For Bacon, nature created a conceptual order; while for Hobbes, man contrived a material order for himself. Bacon's order was not definitive as Hobbes's, rather it participated in the natural flux of things.

This examines the cosmological background of Hobbes' concept of nature and man. Under the background of the infinite universe with the possibilities of a plurality of worlds, intellectual thinking no longer accepted natural hierarchy and intrinsic interdependence. If the new universe is a chaotic space, then the consequence is an endless dispute over the location of authority. The American historian Perez Zagorin argued that "Two revolutions occurred in England before 1688: a political revolt against Charles I, which began with the Long Parliament and had to be fought out in a civil war; and an intellectual transformation that led, later in the seventeenth century, to the

[191] Francis Bacon, *The Works of Francis Bacon, Baron of Verulam, Viscount St. Alban, and Lord High Chancellor of England*, ed. J. Spedding, R. L. Ellis, and D. D. Heath, 14 Vols. (London, 1870; repr. New York, 1968), p.722.
[192] Bacon, *The Works of Francis Bacon, Baron of Verulam, Viscount St. Alban, and Lord High Chancellor of England*, pp.720-22.

enthronement of science and its secular interests among the controlling cultural forces of the age."[193] Was that these two revolutions happened during the same period a coincidence? If England were a microcosm of the universe, the Civil War would signify the result of lack of order. Thus, the restoration of order resumed the political uncertainties of England.

The doctrine of Humanism assumed that the whole universe was made for humans, but did not require that Earth should be located at the centre anymore. The position at the physical centre was not necessary in showing the importance and glory of human beings. Due to the homogeneity of the universe, what applied to the heavens could also apply to the earth, and vice versa. There were possibilities that human beings were able to use reason to find purpose and God's intention was hidden in the natural world.

Indeed, basic concepts such as "order," and "nature" were redefined in the process of the scientific revolution's ferment of new knowledge. Accordingly, the conception of an animate cosmos was succeeded by the view that the world was subjected to the laws of nature. With the unitary divine cosmos lost, everyone was isolated and impotent. In order to reduce the consequent possibility of chaos and fear, it was necessary to create a new order. Theories of the nature of man and theories of the nature of the cosmos were in confusion. Human personality and character had long been interpreted in terms in which the world and the universe were described. Thus, the collapse of this classical cosmic order gave way to an open view of the universe, which evoked a

[193] Perez Zagorin, "Intellectual Origins of the English Revolution. By *Christopher Hill*" (New York: Oxford University Press. 1965. pp. ix, 333.), *The American Historical Review*, Volume 71, Issue 3, 1 April 1966, pp.51–953.

growing awareness of humans' self-consciousness. Human beings produced the new image of the universe and determined the meaning of nature and history.

After what has been discussed in chapters one and two, these two parts indicated in detail how the nature and significance of the cosmological shift transformed from the Middle Ages to seventeenth-century England. A lot of scholars have noticed and their works broadly explained this change in many aspects, such as literature, science, religion and philosophy. Steven Shapin, Paul Kocher, Edward Grant, John Russell and Francis Johnson, are scientific historians whose works mainly focused on the history of the scientific revolution. They described the cosmological challenge to the geocentric model from a scientific perspective. It is about the transformation of natural science from a philosophical and religious by-product to a practical and secular subject. Their work made a solid foundation for this thesis. They collected and analysed the works of Copernicus, Bruno, Galileo, Kepler, Diggs and many "scientists" at that time, which is useful and helpful literature. Though they noticed the influence of scientific revolution on other aspects， a few of them linked it with political theory.

One of the scientific historians, Thomas Kuhn, concluded this cosmological change in his paradigm and used it to explain the intellectual revolution. He claimed that if everything was in cosmological crisis at the same time, then it could bring out a new paradigm. Under the new paradigm, humans deal with the relationship with self, nature, and world in a new way. This thesis has agreed with Kuhn that political thought was influenced by this cosmological crisis as well and shared the same concern with other regions.

E.M.W Tillyard and Marjorie Nicolson analysed the transformation of cosmology in literature. They described a clear process by which literature went through a different expression and perspective. Their limitation is that they did not use more convincing evidence than English drama. Steven Dick and Alexandre Koyre´ focused on the concept of "plurality of worlds" in an infinite universe. The former concentrated on the philosophical part while the latter paid attention to the scientific part. They both noticed that the concept of "plurality of worlds" made a huge impact on human perspectives. Their limitation is that they did not consider the construction of order under this concept. This thesis based on their works tries to show the influence on a political order within the perspective of human change.

Ernst Cassirer, Arthur Lovejoy and Rémi Brague are philosophers who connected philosophical thinking with cosmology, especially concerning the "human place" in this theme. Their work is enlightening in ancient and Renaissance cosmology respectively. But they did not examine cosmology in the seventeenth century and their focus was mainly on Europe rather than on England. The intellectual revolution indeed started in Europe; however, this thesis assumes that the theorists in England were not behind. Instead, they knew and learned the new knowledge from Europe and they developed practical means to solve the crisis. This thesis suggests that political thought in England had a connection with the cosmological transformation and theorists made contributions to constructing a political order in accord with the new infinite universe.

Thomas Hobbes received a humanist education and was familiar with traditional knowledge. At the same time, Hobbes had a relationship with Galileo, Descartes and

Bacon. He paid close attention to their new knowledge. He lived during a transitional age experiencing the nature and influence of cosmological shift. It is hard to believe that any of Hobbes's thought was not related to it, though he is not directly portrayed in this context. In sum, many scholars have noticed the cosmological challenge in the seventeenth century generally. Most of them focused on the philosophical aspect concerning concepts like nature or "self". In some respects, political order is a reflection of the practical use of these concepts. Therefore, this thesis aims to use Thomas Hobbes as a case study to show how Hobbes illustrates the new way of thinking about politics under the influence of the cosmological shift. It will be discussed fully in the next chapter.

Chapter Three: Construction of Order

Thomas Hobbes and Cosmology

Major intellectuals of the late sixteenth century and the seventeenth century Europe were trained as "humanists". Thomas Hobbes was no exception. He learned Latin, Greek and the rest of the Renaissance curriculum at a grammar school. At school, he mastered translation skills which accompanied him for his whole life. In fact, his first published book was a translation of Thucydides, and the *Odyssey* was one of the last publications he translated into English. Scholars suggested that Thucydides enabled Hobbes to articulate his objection to democracy: "[he] pointed out how inadequate democracy is, and how much wiser one man in than multitude."[194] After graduating from Oxford, he found a job in the Cavendish household acting as secretary, tutor and advisor.

Between 1610 and 1615, Hobbes accompanied Lord Cavendish's son, also named William, as his tutor on a tour in Europe. In addition to this trip, he also took a similar journey around Europe in 1630. When he returned to England in 1631, he became acquainted with the "Welbeck Academy", a group interested in natural science, such as mathematics, astronomy and mechanics.[195] William Cavendish commissioned Hobbes to buy a copy of Galileo's *Dialogue Concerning the Two Chief Systems of the World* that was published in 1632, which was a foundation work of modern physics. Hobbes recorded this primary task, "My first businesse in London, was to seeke for Galileos

[194] Robin E. R. Bounce, *Thomas Hobbes* (London: A&C Black, 2009), p.5.

[195] Noel Malcolm, *Aspects of Hobbes* (Oxford: Clarendon Press, 2014), p.21.

dialogues."[196] After that, Hobbes seemingly got involved in these "scientific" concerns and obtained an invitation to meet Galileo himself. In 1634, Hobbes accompanied William Cavendish to Paris and met Mersenne's circle. In summary, these tours gave Hobbes an opportunity to meet politicians and intellectuals through Europe and became aware of the complexities of modern physics and metaphysics.[197]

As was written above, it is reasonable to suppose that Hobbes started his philosophical enquiries in the late 1630s because he was intrigued by modern natural science. Douglas points out that it was around 1635 that Hobbes began to apply mechanism to mind and sensation.[198] According to Frithiof Brandt, Hobbes' bias in favour of the circular motion was derived from Galileo.[199] In Galileo's *Dialogue on the Two Chief Systems of the World* (1632), Salviati says:

"If such a motion [rectilinear] belonged by nature to a body, then from the beginning it would not be in its natural place; hence the ordering of the world's parts would not be a perfect one. We assume however, that the ordering of the world is perfect; consequently, it cannot by nature be intended to change place, nor consequently, can it be intended to move in a straight line."[200]

Hobbes agreed with Galileo that a circle was perfect and it was an appropriate form for motion in the cosmos. He spoke highly of Galileo and believed that motion theory was one of Galileo's achievements. "Galileus in our time… was the first that opened to us the gate of natural philosophy universal, which is the knowledge of the nature of

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196 Thomas Hobbes, *The Correspondence*, ed.by Noel Malcolm, 2 vols (Oxford: Clarendon Press, 1994), I. pp.19-20, and note10.

197 Malcolm, *Aspects of Hobbes*, p.35.

198 Douglas M. Jesseph, "Galileo, Hobbes, and the book of Nature", *Perspectives on Science*, 12， 2014, pp.191-211.

199 Frithiof Brandt, *Thomas Hobbes' Mechanical Conception of Nature* (Copenhagen, 1927), p.330.

200 Galileo, *Dialogue on the Two Chief Systems of the World, in Mathematical Collections and Translations*, tr. T. Salusbury, (London, 1661), p.10.

motion."[201] Brandt concluded that "It is to Hobbes as to Galileo, a fundamental principle that "by nature" there exist revolving motions."[202] It is clear that Hobbes was a supporter of Galileo's new physics in the form of the mechanical universe. As Hobbes put it,

"but the universe, that is, the whole mass of things that are, is corporeal, that is to say, body; and hath the dimensions of magnitude, namely length, breadth and depth. Every part of the universe is 'body' and that which is not 'body' is no part of the universe, and because the universe is all, that which is no part of it is nothing, and consequently nowhere."[203]

Agreeing with Galileo, Hobbes views the universe as "body" which consisted of different parts. The universe was no longer a symbol of animation, but a self-moving machine. This machine was in defined proper sense of the world and consisted of different parts. Bacon asserted that in his book *The Advancement of Learning*, "the same phenomenon in astronomy is satisfied by the received astronomy of the diurnal motion and proper motions of the planets, and likewise by the theory of Copernicus who supposed the earth to move; and the calculations are indifferently agreeable to both."[204] The earth lost its unique central position and was one part in an infinite universe. Like other planets, the earth equally obeyed natural laws of matter in motion.[205]

Hobbes was inspired by Galileo's idea that the universe was motivated by natural forces rather than divine causes, therefore he believed that the state was made to work

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[201] Thomas Hobbes, *English Works of Thomas Hobbes*, ed.by, Sir William Molesworth, 11volumes (London: Bart. John Bohn, 1839-1845), Vol.1, p.viii.

[202] Quoted from Mintz, Samuel I. "Galileo, Hobbes, and the Circle of Perfection." *Isis*, vol. 43, no. 2, 1952, pp. 98–100.

[203] Thomas Hobbes, *Leviathan, or the Matter, Forme, and Power of a Common-Wealth Ecclesiastical and Civil* (Oxford: Basil Blackwell,1946), p.482.

[204] Francis Bacon, *The Works of Francis Bacon*, Lord Chancellor of England: With A Life of the Author by Basil Montagu, ESQ, 3 vols (Philadelphia: Carey and Hart, 1844), p.200.

[205] Kuhn, *The Copernican Revolution*, p.1.

mechanically like the universe. Like the celestial body, the machinery of the state should be tightly regulated and kept in good working order. But Descartes pointed out a failing of Galileo's work, telling Mersenne that "Galileo has not examined things in order and that, without considering the first cause of nature, he has only sought to account for some particular effects, and thus that he has built without foundation."[206] Descartes noted that the old order was inefficient to accord with the new cosmological thoughts. It was necessary for theorists to build a new order like the divine cosmos order, otherwise it was only physical or astronomical effects.

By 1636, Hobbes had met various French mathematicians and philosophers, such as Pierre Gassendi and Martin Mersenne. In that time, Mersenne was the only channel of communication with René Descartes since Descartes was hiding in the Netherlands, and Mersenne put the two in touch. In 1637, Descartes published his famous book *A Discourse on the Method for Rightly Conducting the Reason and Searching for Truth in the Sciences*. To understand Hobbes and Descartes' comparable arguments, it is necessary to understand on what Descartes insisted. Descartes answered this question with his famous Cartesian "ego": I think, therefore I am. Descartes separated the human mind from its own perceptions, and thus it witnessed them as observers witness events outside themselves.[207]

In order to establish foundations for replacing late Renaissance philosophical thought with a new philosophy accommodated with new natural science, Hobbes wrote

[206] Descartes to Mersenne on 11 October 1638, Stephen Gaukroger, *The Emergence of a Scientific Culture: Science and the Shaping of Modernity,1210-1685* (Oxford: Oxford University Press, 2006), p. 194.
[207] Gaukroger, *The Emergence of a Scientific Culture*, p.196.

De Corpore in 1655 and *De Homine* in 1658 concerning the basis of metaphysics and physics. Hobbes described the principle of circular motion from Descartes in *De Corpore*, "whatsoever is moved, will always be moved on in the same way and with the same velocity, except it be hindered by some other contiguous and moved body."[208]

In this book, Hobbes replaced Copernicus' motions of the earth towards sun to a simple inertial motion, and thus provided a different picture of the universe. With the rising view of the mechanical universe, Hobbes attempted to integrate the mechanics and matter theory into a complete cosmological theory. Unlike other purely natural philosophers, his vision started from natural philosophical considerations while proceeding in other areas. Applying pure "scientific" procedures to different areas such as politics, theology and morality was potentially radical because it could lead to heterodox consequences.[209]

Though accepting Descartes' proposition to some extent, Hobbes thought rather differently from the sceptical Descartes. He believed that humans' own thoughts were the product of a physical process within the universe. In Hobbes's early draft of *De Corpore*, he wrote,

"If we conceive the world annihilated except one man to whom there would remain ideas and images of all the things he had seen, or perceived by his other senses…all which though in truth they would be only ideas and phantasms internally happening and falling to the imaginant himself, nevertheless they would appear as if they were external and not depending upon the power or virtue of mind."[210]

Hobbes propounded a number of metaphysical propositions which are important in his political and psychological theories as well. The most important one was motion

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[208] Hobbes, *English Works*, Vol.1, p.125.

[209] Samuel Mintz, *The Hunting of Leviathan* (Cambridge: Cambridge University Press, 2010), pp.63-80.

[210] Thomas Hobbes, *On the Citizen* (Cambridge: Cambridge University Press, 1988), p.15.

theory. Hobbes developed an elaborate philosophical system that defined the operations of nature as the dynamic forces of particles in motion. In Hobbes's ethical and political works, such as *The Elements of Law*, he assumed the theory of motion as the foundation. Sensation is one of Hobbes' central philosophical concepts. The name of the first chapter of *Leviathan* is "Of Sense." The form and motion of Mechanically-interacting particles determines the motions of natural phenomena that are detected by our senses.

Hobbes believed that "Whatsoever accidents or qualities our senses make us think there be in the world, they are not there, but are seemings and apparitions only. The things that really are in the world without us, are those motions by which these seemings are caused."[211] Hobbes argued that what we think we saw was the prevalence of optical illusion. Humans perceive images with our sense; however, it does not suppose that the thing seen is really as we think it is. Hobbes's man alone in the universe would thus be able to think of himself, however, he could not perceive anything doing the thinking. In other words, he could not discern what is really to be found in an external universe. He lacks the ability to discern whether everything he perceives is imaginary or not.[212]

Moreover, Hobbes wrote in order to object to Descartes' *Meditations*, "Although someone may think that he was thinking (for this thought is simply an act of remembering), it is quite impossible for him to think that he is thinking, or to know that he is knowing. For then an infinite chain of questions would arise. How do you know that you know that you know?"[213] In Hobbes's world, the new infinite universe consists

[211] Hobbes, *English Works of Thomas Hobbes*, p.10.
[212] Richard Tuck, *Hobbes: A Very Short Introduction* (Oxford: Oxford University Press, 2002), p.156.
[213] Hobbes, *On the Citizen*, p. xviii.

of homogeneous materials and in an endlessly-motion state, which was neither had intrinsic purpose or order. He applied this theory of motion in mind as well.

In Hobbes's thinking, reason consisted purely of mechanical effects brought about by material objects. In this regard, human beings' "self" can hardly have "free" will. This theory of Hobbes also concerns a Cartesian problem, which is about dreaming. Descartes was troubled by the doubt that everything which humans experience while awake might merely be a dream. As Hobbes said in *the Elements of Law*,

> "Nor is it impossible for a man to be so far deceived, as when his dream is past, to think it real: for if he dream of such things as are ordinarily in his mind, and in such order as he useth to do waking, and withal that he laid him down to sleep in the place where he findeth himself when he awaketh (all which may happen) I know no criterion or mark by which he can discern whether it were a dream or not …"[214]

The second sentence shows that there is actually something outside us, which consist of "motions". This was a widespread view in the seventeenth century, and it raised a new question: what is the actual character of the external world and of our relationship to it. Seventeenth-century natural philosophy turned to atomism and related theories for its explanations of the created order. Most notably in the works of Hobbes and Descartes, an atomistic explanation of nature was put forward in forceful arguments that was considered dangerous.[215] Hobbes's mechanical materialism was particularly dangerous, for it did not separate God from, or place Him above, the created laws of motion.[216]

It inevitably involves the problem of the first cause of motion. Hobbes's alleged

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[214] Hobbes, *English Works*, Vol.1, p.10.

[215] The comprehensive treatment of hostility to Hobbesian philosophy is S. I. Mintz, *The Hunting of Leviathan*, pp.63-80.

[216] Mintz, *The Hunting of Leviathan*, p.63.

endorsements of the cosmological argument are as follows:

"For he that from any effect he seeth come to pass should reason to the next and immediate cause thereof, and from thence to the cause of that cause, and plunge himself profoundly into the pursuit of causes, shall at last come to this: that there must be (even as the heathen philosophers confessed) one first mover, that is, a first and eternal cause of all things, which is that which men mean by the name of God."[217]

Hobbes believed that humans are driven by curiosity and a "love of the knowledge". His inquiry into the causes of natural phenomena is limited. "Curiosity, or love of the knowledge of causes, draws a man from consideration of the effect to seek the cause,…whereof there is no former cause, but is eternal, which is it men call God." [218] This indicates that Hobbes started to think about the internal motivations, and tried to consider order within this different cosmological system.

On the one hand, Hobbes thought that ideas and images derived from the content of sense perception. As he explained that, "the cause of sense, is the external body, or object, which presseth the organ proper to each sense… causeth there a resistance, or counter-pressure, or endeavour of the heart, to deliver itself."[219] On the other hand, he also answered the question of the possible temporal infinity of the world. In contrast to what was held widely during the scientific revolution, Hobbes suggested that the human mind constructs our understanding of the world and this kind of mind is finite and limited.

Unlike Descartes, Hobbes denied that finite human beings have the ability to conceive of the infinite. Indeed, Hobbes held an objective attitude to the concept of infinity: "And although this word *infinite* signify a conception of the mind, yet it follows

[217] Hobbes, *English Works*, Vol.1, p.xii.
[218] Hobbes, *Leviathan*, p.25.
[219] Hobbes, *Leviathan*, chapter I.

not that we have any conception of an *infinite thing*."[220] Moreover, he rejected any attempt to conceive of infinite things. "yet he will not be able to proceed eternally, but wearied will at last give over, without knowing whether it were possible for him to proceed to an end or not."[221] To Hobbes, it is impossible to settle the question, because "whether we suppose the world to be finite or infinite, no absurdity will follow."[222]

Generally speaking, Hobbes argued that humans were not able to understand universal concepts but singular properties of objects.[223] As he wrote in *Leviathan*, "some names are common to many things, nothing in the world universal but names; for the things named, are every one of them Individual and Singular."[224] This view was also related to the rise of a broader sceptical tradition which includes Descartes and Mersenne.

Indeed, Hobbes's nominalism was a more radical position in terms of all kinds of knowledge. This resulted in Hobbes emphasizing that only geometry was a reliable tool to demonstrate the order of the universe.[225] He believed that "Geometry therefore is demonstrable, for the lines and figures from which we reason are drawn and described by ourselves"[226] This led Hobbes to develop a materialist geometry based on the theory of motion. Hobbes originally defined this geometry as "analysis by motions or the

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[220] Thomas Hobbes, *Man and Citizen: De Homine and De Cive*, ed.by, Bernard Gert. (Hackett Publishing), p.199.

[221] Hobbes, *De Corpore*, chapter xxvi, p.1.

[222] Hobbes, *De Corpore*, chapter xxvi, p.1.

[223] David Sepkoski, *Nominalism and Constructivism in Seventeenth-Century Mathematical Philosophy*, (Routledge Press, 2013), p.176.

[224] Hobbes, *Leviathan*, p.26.

[225] Spragens. *The Politics of Motion: The World of Thomas Hobbes.* (Kentucky: University Press of Kentucky,1973), p.137.

[226] Hobbes, *English Works*, Vol.7, p.184.

method of motion."[227]

To this extent, Hobbes wrote, "The paths of motions simpliciter (in which geometry consists) ought to be investigated in the first place, and then the paths of motions generated and obvious, and finally the paths of motion internal and invisible (which physicists study)."[228] Geometry was to him a genuine science that properly represented nature. Pycior believed that Hobbes put geometry and language under the same principle: they were human constructions with the experiences of individual sense, rather than eternal truths.[229]

Then a question arose: why Hobbes chose geometry rather than any other science and how it served Hobbes's purpose. In fact, geometry for Hobbes was the basis of an entire cosmology.[230] It has been suggested that Hobbes did not trust the inherent capacity of the human mind, rather the constructed knowledge drawn from experience. Certainty came from humanity's construction of objects' meanings and gradually developed as conventional definitions.[231] This caused a far-reaching outcome that Hobbes eliminated the importance of original causes. According to Hobbes, only in pure mathematics can there be certainty, because the physical world no longer shows causes to our understanding as the old divine cosmos did. Thus, "geometry is maker's knowledge, since its certainty is grounded in our construction of the objects known."[232]

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[227] Hobbes, *English Works*, Vol.7, p.307.
[228] Hobbes, *English Works*, Vol.7, p.301.
[229] Helena M Pycior, Mathematics and philosophy: Wallis, Hobbes, Barrow, and Berkeley. J. *History of Ideas* 48, 1987, pp. 65–86.
[230] Douglas M Jesseph. *Squaring the Circle: The War between Hobbes and Wallis*. (Chicago: University of Chicago Press, 1999), pp.220-221.
[231] Helena M Pycior, Mathematics and philosophy: Wallis, Hobbes, Barrow, and Berkeley. J. *History of Ideas* 48, 1987, p.73.
[232] David Sepkoski. *Nominalism and Constructivism in Seventeenth-Century Mathematical Philosophy*,

Therefore, Hobbes's *Leviathan* is constructed on a geometric rule.

In Hobbes's view, Galileo had produced the foundation of a cosmology. Hobbes saw mathematics and geometry not as science but a method to reveal the form of motion. Galileo solved the problem of motion by abstract geometry and put forward the law of physics that bodies would keep moving unless stopped by an outside source. As Hobbes explained:

"the science of every subject is derived from precognition of the causes, generation, and construction of the same; and consequently, where the causes are known, there is a place for demonstration, but not where the causes are to seek for. Geometry therefore is demonstrable, for the lines and figures from which we reason are drawn and described by ourselves."[233]

Therefore, Hobbes's philosophy can be seen as constructivism. By doing this, Hobbes transformed the question of the possible temporal infinity of the world to one of the uses of mechanics. Hobbes asserted the mechanical and mathematical of movement was a revelation of the nature of the universe. Hobbes defined motion as "nothing but change of place."[234] and he asserted that "all mutation consists in motion."[235]These two assumptions Hobbes used in politics to argue that change is nothing but change of place. For Hobbes, "place" lost its meaning of "home" as in divine cosmos. The motion is a merely physical change and has no order.

Though Hobbes denied that humans can conceive infinity, his universe was restless, with a striving of endless motion with no order or end. Because inertial motion indicated an infinite universe that was restless, man could not find completion or ends

(Routledge Press, 2013), p.66.
[233] Hobbes. *English Works*, Vol.7, p.184.
[234] Hobbes, *English Works*, Vol.7, pp.83-4.
[235] Hobbes, *English Works*, Vol.1, p.70.

in it. Unlike the old cosmos, it was not ordered by teleological fulfilment.[236] Hobbes wrote that "Universal things have all but one universal cause, which is motion ...and motion cannot be understood to have any other cause besides motion."[237] Moreover, Hobbes went further to write that "There can be no cause of motion, except in a body contiguous and moved."[238] Natural movement is only a simple continuity. The basic characteristic of motion is to persist consistently. There is no need to reach fulfilment.[239]

Finally, motion is homogeneous and automatic. Hobbes regards all movements as simply one form or another of a simple change of place.[240] Hobbes wrote that "Why may we not say that all automata (Engines that move themselves by springs and wheeles as doth a watch) have an artificial life?"[241] Hobbes applied this kind of motion to all types of movements rather than merely physical bodies. He extended this basic principle to all the constituents of the universe, including nature and mind. "And this first endeavor, when it tends towards such things as are known by experience to be pleasant, is called appetite, that is, an approaching; and when it shuns what is troublesome, aversion, or flying from it."[242] Here the appetites and aversions are "motions of the heart."[243]

Generally, Hobbes argued that men's natural passions were two-fold; one was for gain and appetite, the other for self-preservation, or fear of Death.[244] The second

[236] Spragens. *The Politics of Motion*, p.83.
[237] Hobbes, *English Works*, Vol.1, pp.69-70.
[238] Hobbes, *English Works*, Vol.1, p.124.
[239] Spragens. *The Politics of Motion*, p.96.
[240] Spragens. *The Politics of Motion*, p.104.
[241] Hobbes, *Leviathan*, p.3.
[242] Hobbes, *English Works*, Vol.1, p.407.
[243] Hobbes, *English Works*, Vol.1, p.401.
[244] Spragens. *The Politics of Motion*, p.178.

instinct dominated the first and naturally "reasoned" a desire for peace. According to Oakeshott's understanding, reason was "not the arbitrary imposition upon the passionate nature of man; indeed, it was generated by the passion of fear itself."[245] Hobbes said commonwealths were demonstrable rather than conjectural as were the phenomena of natural philosophy. The motions that caused natural phenomena were external to man, but the motions that created commonwealths were internal motions of men's minds.[246] In the *Leviathan* Hobbes defined the Sovereign as the body that controlled the power in the commonwealth.

Borrowing from the recent studies of Harvey, Hobbes also believed that the central organ was the heart and it functioned as the controlling organ in the body.

"For the original of life being in the heart, that motion in the sentient, which is propagated to the heart, must necessarily make some alteration or diversion of vital motion, namely by quickening or slackening, helping or hindering the same. Now when it helpeth, it is pleasure; and when it hindereth it is pain, trouble, grief &c. …Now this vital motion is the motion of the blood, perpetually circulating (as hath been shown from many infallible signs and marks by Doctor Harvey, the first observer of it in the veins and arteries."[247]

The passions motivated human behaviour since the heart determined perceptions, feelings, and desires. Man desired what facilitated the circulation of the blood. This body politic viewpoint proved that all men were uniformly and internally motivated. For Hobbes, "the first dictate of reason is peace; All the rest are means to obtain it, and without which peace cannot be had."[248] In the *Leviathan* Hobbes discussed the definition of reason. "Reason is adding and subtracting, of the consequences of general

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[245] Michael Oakeshott, *Rationalism in Politics* (London: Methuen & Co,1962), p.258.
[246] Spragens. *The Politics of Motion*, p.95.
[247] Thomas Hobbes, *English works*, Vol.1, pp.406-7.
[248] Thomas Hobbes, *Leviathan*, p.70.

names agreed upon for the marking and signifying of thoughts."[249] It was reason that enabled man to evaluate things.

In many ways, Hobbes's philosophy shared with Descartes's a sense of the uncertainty of the real world as essentially different from how we experience it. Since Galileo pointed out that the experience of someone on the earth itself could not determine whether the earth was rotating, this uncertainty was characteristic of the most important achievements of the physical sciences in the seventeenth century. This enquiry is a crucial key to understand how the new philosophies built, and became inserted into European culture during this time.

This thesis assumes that this uncertainty came from the possibility of an infinite universe with an unfixed centre. The old, hierarchical and divine cosmos could no longer provide explanations for human beings to understand the relationship with the outside world. Therefore, Hobbes tried to make sense of a material world outside our minds without bringing in theological postulates but a physical process. Shapin and Schaffer's book perhaps has succeeded in discussing Thomas Hobbes's political theory and the natural philosophy. They wrote that "We shall suggest that solutions to the problem of knowledge are embedded within practical solutions to the problem of social order, and that different practical solutions to the problem of social order encapsulate contrasting practical solutions to the problem of knowledge."[250] Thomas Hobbes had an approach to mechanics that had an influence both on his natural philosophy and his

[249] Hobbes, *De Civie*, pp. 25-26.

[250] S. Shaping and S. Schaffer, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (Princeton: Princeton University Press, 1985), p.15.

political philosophy. For Hobbes, the central concern was political order as violations of natural reason would undermine it. Therefore, his natural philosophical positions were based upon an underlying political premise.

Under this circumstance, Hobbes concluded that "natural law" was based on the new motion theory. Hobbes interpreted emotions and minds of men as inner bodies in physical motions. Humans' emotions, like physical motions, were explained as motivations.[251] Motions continued ceaselessly unless "governed" or refracted by other particles in motion. This was different from the traditional theory which believed in harmony in man and society. Richard Tuck suggested that Hobbes emphasized that the real bodies in motion were the reason why sensations changed, and thus he was able to avoid Descartes' duality that becoming an independent existence of the world.[252] Thomas A. Spragens, Jr.in *The Politics of Motion: The World of Thomas Hobbes* believed it was revolutionary when Hobbes claimed that reason and fear were both internal motions of bodies and the containment was the result of joining them.[253] Spragens defined this process as what Kuhn called "paradigm transformation": "The explicit Aristotelian model is finite and teleological; the Hobbesian counterpart is infinite and inertial."[254] Furthermore, this could lay a foundation for Hobbes's famous theory of social contract and sovereignty by explaining motivations with fear and reason.

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[251] Spragens. *The Politics of Motion*, p.66.

[252] Richard Tuck, "Hobbes and Descartes" in G.A.J. Rogers and A. Ryan(eds,) *Perspective on Thomas Hobbes* (Oxford: Clarendon Press,1988) pp.43-61.

[253] Spragens, *The Politics of Motion*, p.224.

[254] Spragens, *The Politics of Motion*, p.68.

Thomas Hobbes and the Sovereign State

As Alexandre Koyre´ argued, the aim for modern man was different from medieval or ancient man who wanted contemplation of nature and being. Modern man was inspired by one's ability to dominate and master nature.[255] Nature, for the sixteenth and early seventeenth century thinkers, existed for divine purposes beyond its materiality. However, mechanical natural philosophers of the coming age abandoned this conceptual premise. The need for a fundamentally natural philosophy called for renewed discussions to provide an alternative cosmological system to the ancient and medieval one.

Different from other early modern natural philosophers, Hobbes combined scientific methods with political issues which were matters he confronted. The new political theory perhaps was significant evidence of the progress from the divine cosmos to an infinite universe in the late sixteenth and seventeenth centuries. Therefore, it is important to understand the construction of his political theory in *Leviathan* through the philosophical basis of his works.

Last part we have seen how Hobbes dealt with the relationship between natural philosophy and his political theory. It is now time to turn to the matter of Hobbes's unique attempt to apply natural philosophy to his political thinking. "That is, conceptual patterns and models developed to deal with natural phenomena became prisms through which [Hobbes] perceived human and political phenomena."[256] Hobbes derived his

[255] Koyre´, *From the Closed World to the Infinite Universe*, p.69.
[256] Hobbes, *Element of law*, p.7.

political theory based on this foundation. This critical transformation that Hobbes performs led to a new concept of nature. Nature has been defined as "a principle of motion and change."[257] The new world of nature is not a cause of order but the absence of order. It is not a coherent whole instinct towards fulfilment, but merely persists in its motion without end. This understanding of nature showed first in his famous statement "state of nature." In fact, Hobbes did not think nature was the reason for order but "the state of nature" reveals that order was needed in the beginning.[258]

At the pre-political state of nature, anyone who was powerful enough could gain control of everything.[259] It was believed that nature gave her goods as adequate to man's needs, and man's just distribution of these could achieve nature's ends.[260] However, Hobbes extended the "right to everything" to "right of everyone to everything." "for although any man might say of everything, This is mine, yet could he not enjoy it, by reason of his Neighbour, who having equal Right, and equal power, would pretend the same thing to be his."[261] The result is "that the natural state of men, before they entrd into Society, was a meer War, and that not simply, but a War of all men, against all men."[262]

Hobbes asserts that "The cause of war is not that man are willing to have it; for the will has nothing for object but good." But that "man know not the causes neither of war nor peace."[263] The intention of Hobbes was not to eliminate or confront the cosmic

[257] Hobbes, *Element of law*, p.7.
[258] Hobbes, *Element of law*, p.168.
[259] Blumenberg, *The Legitimacy of The Modern Age*, p.219.
[260] Blumenberg, *The Legitimacy of The Modern Age*, p.206.
[261] Hobbes, *Leviathan*, chapter xiv.
[262] Hobbes, *Leviathan*, chapter xiv.
[263] Hobbes, *English Works*, Vol.1, p.8.

chaos, instead, he built upon it. Hobbes put the passions and the minds of men as motivations replacing the first divine cause. Hobbes stated clearly that,

"… as for those that say anything may be moved or produced by itself, by species, by its own power, by substantial forms, by incorporeal substances, by instinct, by anti-peristasis, by antipathy, sympathy, occult quality, and other empty words of schoolmen, their saying so is to no purpose."[264]

However, this was revolutionary as Hobbes excluded the divine powers and substituted simply motions that merely colliding with other bodies. Furthermore, this implies a simple logic that since there was no difference between sublunar and superlunary, the entire universe and human society obeyed the same set of natural laws. The old hierarchy in which one was higher than the other was contrary to natural law.

Hobbes made a reconciliation between the divine cosmos in which monarchical power was the expression of the cosmos and the natural right which people received from the expression of new natural law (motion theory). On the one hand, Hobbes had to admit that under the state of nature which was caused by cosmic chaos, all people were motivated by the desire of preservation of themselves. Hobbes asserts "All men, as soon as they arrive to an understanding of this hateful condition, do desire, even nature itself compelling them, to be freed from this misery."[265] This caused an objective result that everyone was naturally equal and acted casually like irregular articles. On the other hand, Hobbes replaced the monarchical power by the sovereign state whose rights were from the will of people instead of the divine cosmos.

With the uncertainty of the plurality of worlds and the process of the disappearance of order and teleology in nature, Hobbes created a mechanical and artificial universe

[264] Hobbes, *English Works*, Vol.4, p.531.
[265] Hobbes, *English Works*, Vol.2, chapter xvii.

imitating the organic cosmos. The widening horizon of possibilities occurs as the inherent purpose was no longer accepted but rather was given by man.[266] Having constructed the metaphysical and philosophical premise, especially motion theory, Hobbes created the new concept of the state upon the political and psychological nature of man. Since this plurality of worlds is no longer reliably arranged for man's benefit, the declining consciousness inevitably transposed from the anthropocentric and teleological perspective of man and the world.[267] The world was regarded as a system developed from matter and nature was seen as a reality that man can anticipate, alter, or produce.[268]

In this existential universe, Hobbes reduced "divine commands" to merely instinct to preserve one's life, and consequently, "at the very outset of the modern era, Hobbes has produced the model of the "rat-race," . . . with two significant corollaries: ...the universalization of anxiety and the relativization of political ends."[269] Like nature, society must be ordered and created by men. Society and the state were unnatural. They did not reflect any divine purpose or divine order but manifested social purpose and social order.

Only an ordered nature can provide ethical statements or moral judgments. In the classical tradition, moral judgments were from nature for human action. Man did not create the order of the world and he must reconcile his actions to the given order in

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[266] Spragens, *The Politics of Motion*, p.211.
[267] Blumenberg, *The Legitimacy of The Modern Age*, p.205.
[268] Blumenberg, *The Legitimacy of The Modern Age*, p.209
[269] Blumenberg, *The Legitimacy of The Modern Age*, p.190.

which he lives.[270] When the logos from nature disappeared, what was left is the will which consists of natural motions, appetite and aversion. New concepts and definitions of the state, of the commonwealth, and of law were accompanied with a reconsideration of personal and social values and ethics. If motion was natural and if law and order were human creations, how to fulfil the human goal of peace and public welfare without divine restrains?

This indicates that in Hobbes's system, the goal of human action is self-preservation so that man could escape death, even in an ultimate dispensation by God in a second existence. "That the place wherein men are to live Eternally, after the Resurrection, is the Heavens, meaning by Heaven, those parts of the world, which are the most remote from Earth, as where the stars are or above the stars, in another Higher Heaven, is not easy to be drawn from any text that I can find."[271] Hobbes did not save space for higher hierarchical heaven in his cosmology. He admits that "that man shall ascend to his happiness higher than Gods footstool the earth." On the contrary, "no man hath ascended into Heaven, but he that came down from Heaven, even the son of man, that is in Heaven."[272]

Hobbes attempted to establish an ethical means by combining it with secular, temporal and utilitarian interests. The unrevealing aim was to diminish the unsettling possibilities of the plurality of worlds which brought a feeling of insecurity. Unlike Bacon who denied the Copernican heliocentric system and insisted on the old cosmos,

[270] Bragues, *The Wisdom of the World*, p.48.
[271] Hobbes, *Leviathan*, p.482.
[272] Hobbes, *Leviathan*, p.482.

Hobbes was aware of the latest astronomical knowledge and scientific methodology. Different from the optimistic standpoint of Bruno or Descartes, Hobbes held a more conservative attitude towards the infinite universe.

Hobbes secured such a finite and existential system and combined it with the secular state which founded individual self-satisfaction upon man's natural passion. Proper evaluation and knowledge of things served social and personal interests. As Hobbes affirmed, "reason is the pace; increase of science the way; and the benefit of mankind, the end." Hobbes established systematic ethics based upon man's natural desires and tendencies instead of nature or God's good.

In this regard, Hobbes dealt with the relationship between God and man as well. Hobbes concluded that Man could name God but he could not know him ontologically as the finite creature cannot understand what is infinite. He could not assign any ideas, qualities, actions or passive faculties to God since all that had significance for man was finite and temporal, and could be referred only to specific things with specific attributes. Consequently, nothing human could be explained about God.

Such a radical and methodological means of evaluation meant that individual and social worth and importance were judged against new standards and by new processes.[273] By doing this, Hobbes successfully replaced the traditionally ordered social structure as it could not be justified by these new views. Since Hobbes defined the new concepts and definitions of the state, of the commonwealth, and of law, a reconsideration of human psychology and of personal and social values and ethics was

[273] Blumenberg, *The Legitimacy of The Modern Age*, p.210.

necessary. In doing this, he tied the security and order of the public realm to the aspirations of each individual and provided a foundation for the individual to continue to exercise his capacities.

As the state's function expanded in this manner the individual's consciousness of his responsibility for his own destiny developed too. Once morality has been defined as the human conduct fully appropriate to this reality, this could guarantee man to live in peace with each other and escape from conflicts of disagreements and interests. In *De Cive* Hobbes concluded that "one name alone . . . doth signify the nature of God, that is, existent…"[274] Hobbes mentioned in *De Cive* that humans feared temporal death as greatly as eternal death. The new consciousness identified purpose and meaning in the temporal world by understanding motion as natural.

Hobbes focused on how man lived to fulfil life not life after death. "I put for a general inclination of all mankind, a perpetual and restless desire after power, that ceaseth only in death."[275] Man aggrandized in order to secure what was not securable. Hobbes's construction reconciled the psychological need of man to gain peace and salvation in an artificial temporal organization. Though men must live in peace, Hobbes knew as that the "felicity of this life consisteth not in the repose of a mind satisfied…Felicity is a continual progress of the desire, from one object to another."[276] Mortality defined the need for order and described the realm of salvation.

Self-consciousness remained a rare and radical exception during the late sixteenth

[274] Thomas Hobbes, *Three-Text Edition of Thomas Hobbes's Political Theory: The Elements of Law, De Cive and Leviation*, ed. Deborah Baumgold (Cambridge: Cambridge University Press, 2017), p.123.
[275] Hobbes, *Leviathan*, chapter xi.
[276] Hobbes, *Leviathan*, chapter xi.

and seventeenth centuries. The divine cosmos once defined a static society that conceptually assured peace, security and salvation. Hobbes perhaps was the first political theorist who applied a definition of sovereignty upon self-interest, but this self-definition challenged the received metaphorical idea of order and of social-personal relationships.

The changing ideas of humans' "self" and society enable a clearer focus on the work of the person who defined a new secular order during which the English people confronted a crisis in the traditional order. It is reasonable that Thomas Hobbes could be the first one who raised a sovereign state theory to solve the problem. Whereas traditionally order was founded upon the belief that the divine cosmos naturally provides principles, Hobbes's theory derived from a more empirical political consciousness that order was no longer natural, but artificial. It was created by the power of a sovereign which was collected from individuals and was manifestly political and social.

There is a striking expression of this new individual-social relationship and the individual's responsibility for defining order and purpose for himself and society, in the opening sentences of Hobbes' introduction to *Leviathan*.

"For by art is created that great Leviathan called a commonwealth, or state, in Latin civitas, which is but an artificial man; though of greater stature and strength than the natural, for whose protection and defense it was intended; and in which the sovereignty is an artificial soul, as giving life and motion to the whole body..... Lastly, the pacts and covenants, by which the parts of this body politic were at first made, set together, and united, resemble that fiat, or the let us make man, pronounced by God in the creation."[277]

Order was no longer natural, but artificial, created by man and based upon political and

[277] Hobbes, *Leviathan*, introduction.

psychological reality which was a "new consciousness of politics as a matter of individual skill and calculation."[278] Unlike the organic cosmos explaining the divine purpose inherent in every activity, Hobbes' metaphor compared the created state to created man and thus man was the creator. The Leviathan resembled man structurally; it could be organically described.

Consequently, the Leviathan was created to do man's will and to fulfill man's purposes and needs. Man created his own order, his own efficient means to peace and satisfaction. On the one hand, the state was unnatural. It did not reflect any divine purpose or divine order but manifested the political and psychological nature of man. On the other hand, men were merely a multitude of individuals who followed natural instincts without political organization.[279]

In the *Elements of Law* Hobbes maintained that "all laws are declarations of the m ind, concerning some action future to be done, or omitted."[280] This stated that law resulted from the motions of mind, and was created by man. Interestingly, Hobbes modified this statement in *De Cive* so that it referred to "Laws of Nature [as] nothing else but certain conclusions, understood by reason, of things to be done and omitted"[281] Therefore, Hobbes maintained natural laws, but excluded any divine, external origin. And these laws of nature were not necessarily limiting and defining because "actions may be so diversified by circumstances and the civil law, that what is done with equity

[278] Walzer, *The Revolution of the Saints*, p.9.
[279] Thomas Hobbes, *De Civie* in *The English Works of Thomas Hobbes*, ed. Sir William Molesworth, 11 vols. (London:1839-45), Vol.2.
[280] Hobbes, *Elements of Law*, chapter x.1.
[281] Hobbes, *De Civie*, Vol.2, chapter III, p.33.

one time is guilty of iniquity at another."[282]

Moreover, Hobbes denied that law and justice existed before men relegated power to a sovereign. "Justice and injustice . . . are qualities that related to men in society not in solitude."[283] Man's natural passions became the foundation for a system of civil law and the concept of natural law. Hobbes asserted that the law of nature and human law "contain each other, and are of equal extent"[284] This point was quite radical and different from other philosophers. For Hobbes, "this of our artificial man the commonwealth, and his command, that maketh law."[285]

Hobbes extended mechanics to the political field in a well built and ordered artificial body, which was constructed for the commonwealth. The motions that caused natural phenomena were external to man, but the motions that caused (created) commonwealths were internal motions of men's minds.[286] Hobbes needed to look for an alternative model to the "organic" body politic. From this perspective, Hobbes seems to put the traditional organic model for the body politic into the new mechanical model. Therefore, the mechanical motion of the artificial collective body would function under laws of nature.

In the *Leviathan* Hobbes defined the sovereign as the artificial man that controlled the power in the commonwealth. From this perspective, *Leviathan* made it possible to keep a lawful, deterministic sovereign within the laws of nature. Hobbes' conception of man and of man's creation and the representative secular sovereign state as the basic

[282] Hobbes, *De Civie*, Vol2, chapter III.p.29.
[283] Hobbes, *Leviathan*, p.83.
[284] Hobbes, *Leviathan*, p.174.
[285] Hobbes, *Leviathan*, p.176.
[286] Spragens, *The Politics of Motion*, p.247.

institutional agent established the foundation on which man could positively enter into modernity. The political order of Hobbes, however, posited a non-eschatological existence. There is no purpose beyond natural man, which predetermines social, personal, or political order.

Though the organic metaphor was popular in sixteenth-century political theory, Hobbes's use of it was quite startling. It was true that his Leviathan resembled the human body. But unlike organic resemblances explaining the divine purpose inherent in every activity, Hobbes' metaphor was created to do man's will and to fulfil man's purposes and needs. As Walzer reminds us, as reality and theory merged "order became a matter of power and power a matter of will, force, and calculation."[287]

Just as the old divine cosmos provided a firm foundation for sixteenth-century ideas of society and state, the evolving consciousness of an infinite universe with plural inhabitable worlds supported the new conceptions of society and state during the middle years of the seventeenth century.

Hobbes argued that humans created the commonwealth as a re-evaluation of the idea of the sovereign state. Without political organization, they were merely a multitude of individuals who followed natural instincts and who conformed to no sense of order.[288] As said, he suggested that the motions that caused natural phenomena were external to man, but the motions that caused (created) commonwealths were internal motions of men's minds. Hobbes commonly maintained that "concord amongst men is

[287] Walzer, *The Revolution of the Saint*, p.160.

[288] Thomas Hobbes, *De Civie* in *The English Works of Thomas Hobbes*, ed. Sir William Molesworth, 11 vols. (1839-45), vol. 2.

artificial, and by way of covenant."[289] The concepts of sovereignty and representation were cornerstones for his entire understanding of order and the state. In the *Leviathan* Hobbes defined the sovereign as the body that controlled the power in the commonwealth.

In this respect, Hobbes radically changed the organic sense of representation and posited a view of sovereign representation. The sovereign represented the community and social and political organization ordered and governed by force of will. The sovereign secured man without against living in a condition of chaos, while each man's end became the public good. Hobbes' sovereign was the authority that conciliated means and ends into one ordered society.

Conclusions about sovereignty and authority required a rethinking of the traditional understanding of law and morality. Hobbes asserts that "for a generall inclination of all mankind, a perpetuall and restless desire of Power after power, that ceaseth only in death." Human life, like all the world, move endlessly and insatiably. To summarize, Hobbes begins his consideration of the nature and tasks of political order from the fundamental paradigm of natural action. To substitute the "divine cosmos", the secular state functioned as an artificial constructed for order and security in the world. The new consciousness that understood that motions were natural and that order and security were contrived, identified purpose and meaning in the temporal world.

[289] Thomas Hobbes, *Element of law*, chapter 19.

Conclusion

The sixteenth- and seventeenth-century underwent a noticeable shift in the cosmological challenge from the geocentric model to the model of a plurality of worlds. From Copernicus, who decentered Earth from its central position in the cosmos, to Newton, who finally defined universal laws, Western Europe and specifically England experienced a new approach to enter the modern world.

Stephen Toulmin argued, "the more vigorously Galileo advocated the new Copernican System – the Earth being just one more planet moving around the Sun– the more pressing was the need for a full renovation of natural philosophy."[290] Indeed, the simultaneous collapse of cosmology affected all realms under threat, and therefore a brand new way of order needed to be restored and underpinned. The issue of transformation of "natural science" in the scientific revolution from religious theology to empirical methodology has been well considered. Though the birthplace of this revolution was in Europe, England acted as a leading role in the construction of a new order which accorded with the new cosmological model. Thus we have seen that the transformation of political thought accorded with the same cosmological transformation, particularly in the works of Thomas Hobbes, which has not been fully explored.

More work needs to be done by historians to understand the histories of England's political thought as not only focusing on its practical part but also contributing to a fuller understanding of England's past, present and future. From a wider cosmological

[290] Stephen Toulmin, *Cosmopolis*: *The Hidden Agenda of Modernity*. (Chicago: University of Chicago Press, 1990), p.71.

background, there are sources that need more exploration. The connection of changing cosmological politics with scientific improvements has been overlooked by modern scholars. Generally speaking, cosmology may be understood as one of Kuhn's "paradigms" which shapes and orders private and public perceptions of humans, nature and God's relationship. Politics is about how to arrange order in human society. In Aristotle's famous comment, "a human being is by nature a political animal." The key question is how to arrange humans orderly and willingly to be inhabitants on Earth. Intellectual history which focuses on the relationship between cosmology and politics is concomitantly a history of changes in perception and a history of the change of order. A change in cosmos reflects a change in human consciousness. The self-defined, articulated, representative order of the mid-seventeenth century resulted from the development of self-consciousness.

In the seventeenth century, along with the development of the scientific method and instruments, political order was no longer a perception of the natural order. It resided in definition by human consciousness and language developed as an abstract tool. It is no coincidence that such a change in consciousness and structuring of reality followed upon the development of printing and the Protestant emphasis on "literal" interpretation.

Kuhn's general paradigm model allows for an examination of this history of self-definition within the configuration of the larger revolution in science and cosmology. "General revolutions in sensibility…are results of an overloading of a received

mechanism of encodation beyond its capacity to function at all."[291] Research into this change offers insights which support the understanding of the relationship between consciousness and order of political theory in early modern England.

Among philosophers during the period, Thomas Hobbes was perhaps the first one to construct his own systematic political order. The key to understanding Hobbes's universe rests in his scientific method. It does not improve or change the normal interpreting of Hobbes's political theory but provides a new cosmic vision which has been overlooked. Moreover, it also provides a new perspective of how Hobbes solved the problem confronted as a political theorist due to the transformation of cosmology, thereby interpreting the political consequences of a different cosmic view.

By defining order in a representative sovereign state Thomas Hobbes redeemed the self in society. For Hobbes, order resided in the definition of humanity and the state manifested the creating principle of positive self-society relations. As Voegelin said: "Articulation . . . is the condition of representation. In order to come into existence, a society must articulate itself by producing a representative that will act for it."[292] Hobbes made the secular sovereign state the representation. Given the possibilities of a plurality of worlds, man creates a self-defined state and simultaneously transfers his capacities to his creation which uses them for the benefit of the commonwealth. The articulated Leviathan manifests the self-definitive. In conclusion, the opening of modern history is a human and creative process associated with the decline of the divine

[291] Hayden V. White, "The Tasks of Intellectual History," *The Fiction of Narrative: Essays on History, Literature, and Theory,1957-2007* (Maryland: JHU Press,2010), p.618.
[292] Eric Voegelin. *The New Science of Politics* (Chicago: University of Chicago Press,1952), p.41.

cosmos. It is probably that from Hobbes, the history of modernity becomes the history of consciousness.

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